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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and to improve the character of the service rendered to the public.

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DEVELOPMENT OF ELECTRICITY ON BOARD OCEAN LINERS.

The speed of ships has increased during the last twelve years from 20 to 23½ knots, the size from 10,500 to 16,500 tons, and the power of the main propelling engines from 20,000 to 36,000 indicated horse power. The number of passengers carried has also risen 33 per cent., the first-class passengers having increased at a greater ratio. The use of electricity for lighting has developed at a much greater rate—quite 100 per cent. The apparent discrepancy between recent German ships is partly explained by higher candle power, so that one lamp may take the place of a pair in many brackets. The increase is due also to the tendency towards providing a larger number of state-rooms for one or two passengers, while the area of the public rooms, decks and passages has also grown at a greater rate than the number of passengers. As a matter of fact, the kilowatt capacity of the generating plant has multiplied threefold and is particularly high in the two latest German ships. All these facts suggest the use of electricity for other purposes than merely lighting. Thus, the capacity was about 6.7 watts per ton of ship in the Campania; in the Kronprinz Wilhelm, 22 watts per ton.

In the Campania, built in 1893, ventilating is about the only use to which electric motors are put, if we except one or two smaller applications in the steward's department. In the Oceanic, in addition to 2,000 lights, there are five ventilating fan motors, a motor in the barber's shop, one for the coffee-mill, one for the ash-hoist, and another for the store-lift. There are also two electric roasters in the galley, five electric water boilers, a coffee boiler, two cookers, fifty-six heaters in state rooms, etc. The credit for the application of an electric installation in the City of Berlin, built in 1875, was due to the old Inman line, which had introduced from time to time many improvements alike in passenger accommodation, steam propulsion, and general equipment. Another instance of an early application was that of a searchlight for the first time in a merchant steamer; this was on the City of New York, built in 1888. Great advances, of course, have been made since then; the City of Berlin, for instance, was provided with arc lights, for her equipment was prior to the invention of the incandescent lamp. A complete revolution has also been made in the design of generating plant. The dynamos on the City of New York were driven by belting. In recent years many changes have been made in the method of distribution, and more consideration has been given to the better protection of cables and wires. But probably the latest and most perfect application of electricity on board ship is the installation on the most modern liner of the Atlantic ser-

vice—the North German Lloyd twin-screw steamer Kronprinz Wilhelm. There are about 15,000 meters (over nine miles) of armored cable in the ship, having a cross section of from 800 to 1.5 square millimeters for main leads and branches in the machinery department and on deck; while of compressed rubber leads for the branch cable system there are 45,000 meters (about 28 miles), having cross sections of 1.5, 2.5 and 4 square millimeters. The whole installation gave employment to from forty to sixty workmen—fitters, smiths, electricians, and carpenters—for a period of about six months. The electric installation is in all respects admirably arranged, and will greatly promote the safety and comfort of a floating population numbering often over two thousand persons. Electricity has been largely utilized in the Kronprinz Wilhelm for insuring its safe navigation. There is, first, an appliance which records on the bridge whether or not the doors are closed at the various levels of the watertight bulkheads dividing the ship transversely. A diagram of this signaling arrangement, with its electrical connections, shows the situation of the doors. This recorder indicates to the captain on the bridge whether and when, all the watertight doors are properly closed. There are forty of these doors, twenty-one of which, in the boiler and engine rooms, are below the load water line, and these are closed vertically, while the remaining nineteen move on a vertical axis. On each of the doors there is a watertight enclosed contact, so that immediately the door shuts a light is thrown upon the diagram of the ship fixed on the bridge, the lamp being placed on this longitudinal section in a position exactly corresponding with that of the doors, so that at a glance the locality of any unclosed door can be seen. For this watertight compartment signalling apparatus about 3,200 meters (3,600 yards) of armored cable, and about 1,200 meters (1,300 yards) of pressed rubber protected cable is used. In order to summon the crew on deck promptly in case of emergency, or to call the men to their posts for the closing of the watertight compartments, etc., an alarm system of signalling has been installed, consisting of thirty-six alarms, which are distributed in all rooms occupied by the crew, either on or off duty. These alarm bells are divided into circuits, one having twelve bells distributed in the boiler and engine rooms as well as in the dynamo and the store room—that is, in all quarters where there are watertight compartments below the load line. The second circuit serves the upper part of the ship with twenty-four bells.

IN THE SERVICE OF PROSPERITY.

The consumer of iron and steel who has been in business for years is passing through a new experience and is performing, perhaps unconsciously, but none the less surely, a notable service to the general trade, says Iron & Steel. It has to a considerable degree fallen upon him to lengthen the period of prosperity which is upon the land. This is accomplished by a forced restriction of his output. Taking things on the average, the mills and furnaces are perhaps two to three months behind in their orders. This means that if they were able to ship promptly all the material that is asked of them, the consumption would at this time be increased by this amount produced at least to three months. It is fortunate, looking to the interests of the trade as a whole, that the products of iron and steel are unable to furnish the vast volume of material that has been asked of them. The American people have demonstrated in various instances in recent years that they are impulsive. When they want anything they want it badly and take measures to procure it, if possible. For several years they have wanted iron and steel voraciously and they have taken it. Were their full wants supplied, there is the probability that eagerness might lose its edge. It is human nature, and American nature with the rest of mankind, to want that which is not attainable. So the present difficulty in obtaining metal, only spurs the demand. Most manufacturers in the west are reconciled to the fact that they cannot obtain prompt shipment of material, even though their trade suffers. They are all getting a fair portion of the metal they can use and with this supply are doing a very satisfactory business. It is better that this present business be protracted than that all possible orders are filled with dispatch, with an uncertain future beyond.

OUR FOREST RESERVES.

The total area of government forest reserves now amount to 46,410,210 acres, contained in forty-one forest reserves, three of which were set apart within the last year, says the Southern Lumberman. The size of the reservations will be better comprehended when it is stated that their total area about equals that of the states of Illinois, New Hampshire and New Jersey combined. This is certainly a large domain, but undoubtedly it will be largely increased within the next few years. It is hoped that the next increase will come from the establishment of the Appalachian forest reserve. Commissioner Binger Hermann, of the Central Land Office, recommended in his report of last November that no reserves be created until Congress modified and repealed the law under which the reserves are now administered, and recommended that an act be passed which will provide that all public lands more favorable for forest reserves than for other purposes shall be withdrawn from settlement, entry, sale or other disposition, and held for the protection and utilization of the timber in accordance with provisions of the reservation laws. Commissioner Hermann also recommended the establishment of national parks for the preservation of prehistoric ruins, petrified forests, caves, and other attractions, and recommended that the provisions of the forest fire act, approved May 5, 1900, be extended to meet the various causes of fire and overcome the danger from every source. The appropriation asked for to prevent depredations on public timber and to protect public land from unlawful entry for the coming fiscal year is \$185,000, with an extra appropriation of \$10,000 for the protection of the unreserved lands against fire. Without having gone very fully into the matter, we have no hesitation in saying that these appropriations are greatly inadequate. No efficient protection can be exercised over so large a territory as is now embraced in the forest reservation at such a cost, and until the government comes more clearly to recognize the extent of the damage annually wrought in its reserves by fire there will be lacking a big element tending to popularize government forest reservations in the public mind. The notion already exists that in many sections the work of the government only results in depriving lumbermen of the timber to allow it to be destroyed by fire. Prof. Schenck's idea is the correct one; practical forest reservation means intelligent lumbering, the cutting of the timber on the land under regulations strictly enforced for the preservation of the smaller and immature timber, and rigid fire protection.

MINING IRON ORE IN NEW ZEALAND A FAILURE.

No iron ore is worked in this colony, writes United States Consul Frank Dillingham, from Auckland, New Zealand, all attempts at forming companies having proved a failure, principally because freights on iron are so low from England to New Zealand that the English production would compete severely with colonial iron manufacturers. Besides, pig iron is admitted duty free, as well as black iron sheets, which are galvanized and corrugated in New Zealand, while the finished article is charged \$9.72 per ton by way of protecting local manufacturers. Hematite iron ore occurs in several places in the colony. At Para Para, in the provincial district of Nelson, government reports state that 650,000,000 tons of this ore occurs on a hillside, with crystal limestone within a mile of it and coal in close proximity, and Para Para is situated in Golden Bay, in which all the navies of the world might ride at anchor. Black titaniferous sand is also found in abundance on the west coast, principally near New Plymouth, of the Taranaki province. Attempts were made some years ago to work this, but they ended in failure. It is said that a company is being floated in London to work these black sands, but nothing definite is known.

Several deposits of manganese ore occur in Whangarei, north of Auckland, at Waiheke Island, close to Auckland, and also at Wairoa South, not far from Waiheke. Shipments of this material have been made from time to time, but the quantity sent away is small, only amounting to a few hundred tons a year. One huge deposit at Wairoa South has been slightly explored, showing a lode of rich manganese ore from 16 to 17 feet in width.



DETROIT.

Special Correspondence to The Marine Record.

Capt. William Murdock, for years in command of boats in Smith, Boutell and Reed lines, died of paralysis last Saturday morning at Bay City. He was 48 years old and leaves a widow and two children.

The steamer William F. Fitch, building for the Franklin Transportation Co., of which Mr. D. R. Hanna is president, will be launched at the Wyandotte yard of the American Ship Building Co., Saturday.

The steamer J. J. Hill, formerly owned by C. T. Morley, of Marine City, has been sold to Eastern men whose names are withheld. The understanding is that she will be taken to the coast and used in the trade.

The steamer Mark Hopkins was placed in the Orleans street dock of the Detroit Ship Building Co. last Saturday, and will receive repairs made necessary by her long rest on the beach off Long Point. She will be given new steel arches and steel trusses, a caulking and general overhauling.

The following meteorological observations are furnished by the office of the United States Weather Bureau, Detroit, for the week ending, 8 p. m., April 8, 1902: Prevailing wind directions for the week, west; highest velocity, 36 miles from the northeast on the 8th; mean temperature for the week, 39 degrees; highest temperature, 53 degrees on the 6th; lowest, 28 degrees on the 8th.

The Detroit & Buffalo Steamboat Line will be in operation now in less than two months, the two boats being well along toward completion at the yards of the Detroit Ship Building Co. The line will probably have eventually a six months' season but the plan at present is to operate the boats from about May 15 to October 15. The boats will be held in port for nothing but foggy or thick weather as their great power, and immense beam and weight will enable them to proceed through any sea that might arise on Lake Erie.

The vessels of the Pittsburgh Steamship Co. have opened the season with bad luck. Half a dozen boats of that fleet have been in trouble during the past week, and four of them have gone ashore. The big steamer Van Hise went on Bois Blanc island in the Straits Sunday night. Wednesday reports were that the steamer Lasalle was ashore on White shoals, and that the steamer Crescent City and whaleback barge 130 were stranded on Point Au Sable, Lake Superior. After jettisoning about 600 tons of ore the Van Hise was released Wednesday afternoon.

R. R. Meatheny, of Grand Rapids, and Daniel W. Kaufman, of Marquette, have awarded to the American Ship Building Co. the contract for building two car ferries, each with a capacity of thirty cars, to cost approximately, \$1,000,000. The ferries will be 400 feet long by 58 feet wide, to draw 20 feet of water and will be the most powerful on the lakes. They are to be built either in Detroit or Cleveland, that matter to be settled in the future by the company. The ferries will ply between Manistique, and Northport, connecting the Manistique, Marquette & Northern railroad and the Traverse City, Leelanau & Manistique line, across the upper portion of Lake Michigan. These lines recently came into possession of the syndicate represented by Meatheny and Kaufman. The contracts also are let for a new outfit of cars.

MILWAUKEE.

Special Correspondence to The Marine Record.

The excursion steamer City of Grand Rapids will be operated by a brewery firm between this city and Whitefish Bay during the summer.

Capt. Edward Saveland, one of the best known masters on the Great Lakes, died here Monday after an illness of a year. He had resided in Milwaukee about forty years, during which period he had sailed the lakes.

By the terms of a deal closed in Manitowoc Tuesday, the Reiss Coal Co. will, beginning May 1, assume charge of the Wisconsin Central coal docks in that place, formerly operated by the Jones & Adams Coal Co. The Reiss company also controls the Northwestern coal docks.

Damages of \$10,000 a year to their stock of dry goods from smoke and soot emitted from the smokestacks of the steamers of the Goodrich Transportation Co. are the basis of an injunction filed against the transportation company by Gimbel Bros., of this city. The firm seeks to enjoin the steamboat line from operating its steamers in such a manner as to allow them to emit smoke in violation of the city ordinance in regard to the smoke nuisance.

CHICAGO.

Special Correspondence to The Marine Record.

The first line boat to leave at this end of the route was the Chicago, of the Western Transit Line, which left South Chicago Monday afternoon. She went light to Duluth to take on a full cargo of flour for Buffalo.

Considerable grain in small lots and mainly up the south branch was on the market this week at 1½c for corn and 15½c for wheat to Buffalo. Two or three small cargoes will probably be placed at these figures.

The steamer Wilkesbarre, of the Lehigh Valley line, this week loaded the first cargo of package freight ever shipped from South Chicago. The cargo consists of 4,700 tons of flour, glucose, and general merchandise taken on at Rock Island dock, and 500 tons more loaded at the Belt line dock.

The steamer Luzon was successfully launched at the South Chicago yards of the Chicago Ship Building Co. last Saturday afternoon. Miss Cora Prendiville wielded the champagne bottle, and the big fleet of steamers now undergoing repairs at the yards did their best to deafen the big crowd of spectators with their whistles when the boat struck the water.

The following meteorological observations are furnished by the office of the U. S. Weather Bureau, Chicago, for the week ending Wednesday April 9, 1902. Prevailing wind directions for the week northeast; highest velocity 33 miles, from the north on the 8th; mean temperature for the week, 37; highest temperature 61 on the 6th; lowest 23, on the 7th.

When Capt. John Jurgins, of the tug Harry C. Lydon, returns to Chicago from Toledo he will find awaiting him two warrants for his arrest. One is for the alleged violation of the law regulating the dumping of refuse off the city water front, and the other is for his alleged failure to obey the orders of the harbor master. The warrants were issued Monday on complaint of Louis Smith, of the government engineer's office. Violation of the law prescribing that refuse must not be dumped within five miles of the harbor, it is said, have been frequent during the past few years, especially since the beginning of the work on the drainage canal. Capt. Jurgins, however, is the first tug captain to be proceeded against for the offense. In his complaint Smith recites that on March 27, while the tug Lydon was towing two loaded scows down the river, the captain was ordered by Assistant Harbor Master White to stop and allow an examination as to whether an inspector was aboard. Capt. Jurgins did not stop. The alleged violation of the dumping law was committed the same day. It was found upon inquiry at Lydon & Drews' office that Jurgins had been assigned to some harbor work at Toledo, for which the company has a contract, and might not return to Chicago this season.

DULUTH-SUPERIOR.

Special Correspondence to The Marine Record.

Capt. William Bassett, who for several seasons has been master of the steamer City of Collingwood, will command the new steamer Huronic, which will run this season between Sarnia and Duluth.

The light-house keepers and their assistants of the lights on Lake Superior who have been spending the winter at their homes in Duluth, have taken up the duties of their stations this week. Among those who left Monday morning are, John Malone, keeper, and Albert Malone, assistant keeper of the light in Menagerie Island; Alex. Shaw, keeper; John Campbell, first assistant, and Henry Casey, second assistant, at the Passage Island light.

The steamer Howard L. Shaw cleared here Monday with 252,000 bushels of flax for Buffalo. She enjoys the distinction of having carried the three most valuable cargoes ever loaded out of Duluth. She carried two cargoes of high priced flax last fall, and it now transporting the third. The value of the cargo which she took out yesterday was \$440,000. Her three flax cargoes had an aggregate value of \$1,300,000.

The tie-up of the tug fleet here is complete, and all the employees of the Great Lakes Towing Co., including the dispatching force, have been laid off, until settlement of the firemen's strike. The difference between the firemen and the tug company has now resolved itself into a test of endurance. Vessels will be able to do their own towing until storms arise, when the situation will become serious.

Some important amendments have been made to the harbor regulations of the Duluth-Superior harbor. The recommendations for such were made by Capt. D. D. Gailard and were approved by Assistant Secretary of War William C. Sanger, April 3. The amendments have to do with log towing through the Duluth ship canal. Heretofore, in recent years at least, log towing has been prohibited through the waterway. This year it is to be permitted under certain conditions. The new rules permit of wider rafts being towed through the Wisconsin entry than last year but there is a limitation on the length of them, which did not exist before. The new rules seem to be very liberal and the lumber firms will probably find them entirely satisfactory.

BUFFALO.

Special Correspondence to The Marine Record.

The name of the steamer H. J. Jewett, of the Union Steamboat Line, will be changed to Binghamton. It is the intention of the management of the line to have the names of the vessels of the fleet all correspond with those of cities along the line of the Erie. The John Mitchell of the W. H. Gratwick Line has also been changed to Major.

The following meteorological observations are furnished by the office of the U. S. Weather Bureau, Buffalo, for the week ending April 9, 1902. Prevailing wind direction for the week, southwest; highest velocity 49 miles, from the northeast, on the 8th; mean temperature for the week, 40; highest temperature 57, on the 6th; lowest, 30 on the 5th.

Navigation was opened at this end of Lake Erie at 6 o'clock Wednesday morning, by the departure of the steamer Progress, of the Corrigan fleet, followed by the Robert Wallace, Minnesota, towing barge Frank Ewen, Bulgaria, Kennebec, John Eddy, Wyoming, Plankinton, H. W. Oliver, Senator, Colonel, Beilman, Aurania, Hutchinson, and Spencer. The last boat got away at 1 o'clock. The first boat to arrive was the Carnegie.

Bateman, McDougall & Palmer have purchased the plant of Dunbar & Sullivan at the "Soo" and will add it to their Buffalo yard as soon as navigation is opened. The machinery is new and consists of large punch, shears, horizontal punch, angle-iron shears, radial drills and other machines. A large shop is to be erected for their reception. When put in position the firm will have a modern plant and be able to handle all work with dispatch.

An agreement to regulate the handling of all grain at this port has been reached. The agreement with the Lake Carriers' Association provides that all men employed in the handling of grain at Buffalo this season shall be union men. In the event of any trouble arising between the I. L. A. and the Lake Carriers' Association the difficulty is to be settled by Thomas W. Kennedy for the Lake Carriers, and J. J. Joyce, president of the Grain Shovelers' local union, No. 109. If these two men cannot agree, a third disinterested party will be called in and the decision of any two will be final. The wage scale for unloading vessels is fixed at \$2 per 1,000 bushels, with \$3 for overtime. The price for handling wet grain will be 30 cents per hour.

The ten life saving stations of the tenth district of the United States life saving service opened their doors at midnight last Friday, following the orders of Capt. Chapman, the superintendent of the district. These include the stations along the coasts of Lakes Erie and Ontario. They will remain open for the rescue of all distressed ships in those waters until the close of navigation in the fall. The stations along Lake Eries are located at Point Marblehead, Ashtabula, Cleveland, Erie, Fairport and Buffalo. The stations on the shore of Lake Ontario are at Fort Niagara, Charlotte, Oswego and Big Sandy Point. All of the boats at these stations have been thoroughly overhauled during the winter months and are now ready to be put in commission for the coming season. Several boats of new design have been sent to the stations on Lake Ontario.

The following bosses have been appointed by Superintendent Kennedy: City elevators, A and B—Bosses, John Keefe and James Quinn; assistants, Timothy Sullivan and Patrick Tubridy. Niagara elevators A and B—Bosses, Wm. Naughton and John McGowan; assistants, Thomas Barrett and Peter Arbor. Great Northern Elevator—Boss, Michael McNamara; assistants, Patrick McDonough and Edward Fitzgerald. Electric Elevator—Boss, Stephen Sharrow; assistant, Thomas Manahan. Coatsworth, Kellogg and Wheeler elevators—Boss, John Leardon; assistant, Michael Driscoll. Great Eastern Elevator—Boss, Michael Griffin; assistant, Neil O'Brien. Marine Elevator—Boss, James Walsh; assistant, John Breen. Dakota and Frontier Elevators—Boss, Thos. Sheehan; assistant, Thomas Cavanaugh. C. T. R. R. Elevator—Boss, James McNamara; assistant, Maurice Griffin. Evans, Ontario and Bennett Elevators—Boss, John Costello; assistant, James Murray. Erie Elevator—Boss scooper, Daniel O'Dea. Export Elevator—Boss scooper, Thomas Ellis. Wells Elevator—Boss scooper, David Coughlin. Exchange Elevator—Boss scooper, Michael Donovan.

MARINE PATENTS.

- 696,394.—Combined windlass and warping winch. Jacob R. Andrews, Bath, Me.
- 696,463.—Life raft. Daniel G. Martens, London, England.
- 696,581.—Self-loading bucket for dredging. Joseph A. Mumford, Roslyn, N. Y.
- 696,621.—Life-boat. Carl E. Pearson, Bergen, Norway.
- 696,666.—Horizontal paddle wheel for propelling ships. Viktor Berg, Abo, Russia.
- 696,703.—Hand power propeller. Isaac A. Wilson, Detroit, Mich.
- 696,723.—Marine railway. Charles M. Davis, Cambridgeport, Mass.; assignor of one-half to Jacinthe S. Condinho, East Cambridge, Mass.
- 696,748.—Rope clamp. Clark F. Rigby, New Martinsville, W. Va.
- 696,874.—Seine pursing machine. William B. Lantz, Gloucester, Mass.

CLEVELAND.

Special Correspondence to The Marine Record.

Messrs. Bartlett & Linker, agents, announce that the first steamer of the Union Transit Co. will leave Cleveland, west bound, on or about April 10th, and the first steamer of the Merchants' Montreal Line will leave Cleveland, east bound, on or about April 20th.

Mr. J. C. Gilchrist purchased the steamer Vulcan, Wednesday. She was formerly owned by Drake & Maytham, of Buffalo. The price of the boat is not named. The Vulcan is one of the trim craft of the lakes, being an economic boat, easily handled and inexpensively operated.

M. A. Hanna & Co. have decided to locate a rapid coal loading machine at Ironville. The specifications have not been completed, but the general plans call for a modern machine. As soon as the machine has been selected, work will be begun on the foundation. It is expected to have the machine in operation this summer.

The following meteorological observations are furnished by the office of the U. S. Weather Bureau, for the week ending April 9th. Prevailing wind directions for the week, west, highest velocity, 58 miles, from the north on the 8th. Mean temperature for the week, 38, highest temperature, 44 on the 8th; lowest, 28 on the 5th. Sunrise and sunset data computed for local time; April 11th the sun rises 5:26; sets 6:36; April 14th sun rises, 5:22; sets, 6:40; April 17th sun rises, 5:17; sets, 6:43.

Additional honors have been bestowed upon Mr. Harvey D. Goulder, general counsel for the Lake Carriers' Association, and one of the most prominent marine lawyers in the country. Mr. Goulder was elected president of the Chamber of Commerce Board of Directors, Wednesday. He has been an active member of the chamber for a number of years, having joined the old board of trade in the 70's. For the past year he has been first vice president of the chamber and chairman of the maritime board.

The Lake Carriers' committee on aids to navigation has received the information from Washington that a clause has been inserted in the sundry civil bill to provide funds to permit the Light-House Board to take over the private lights now maintained by the Lake Carriers' Association on the Lower Detroit river. The same advice have it that an amendment has also been attached to the bill in the Senate to provide funds for the purchase of a lightship for Southwest Shoal. This amendment is understood in the House, and will likely pass there also, when arrangements have been made through the Secretary of State with the Canadian marine authorities permitting the maintenance of a United States lightship in Canadian waters. It is expected that with the funds thus obtained the government will purchase the Kewaunee, now doing duty for the Lake Carriers' Association on Southeast Shoal.

The new steamer Steel King was launched at the Lorain yards of the American Ship Building Co. last Saturday. Owing to the tug strike it was impossible to get a tug to assist in the launching. The ship builders and the new boat, however, were able to go on with their business without a tug. There was not a tug whistle or any other whistle to welcome her to the water. Even the ship yard whistle remained silent. It was an unusual launching. The boat is a duplicate of the other four Gilchrist boats, which are ready for delivery. Miss Agnes Gilchrist, daughter of J. C. Gilchrist, christened the boat. She carried a huge bunch of tea roses and was surrounded by many friends and relatives. A special car brought the party here over the Lorain & Cleveland, and on the return trip a luncheon was served. Those in charge of the christening party were: J. C. Gilchrist and wife, A. J. Gilchrist and wife, J. H. Gilchrist and wife, George Keun and wife, S. C. Smith and wife, J. L. Wicks and wife, F. A. Goodell and wife, A. A. Stearns and wife, D. J. Mitchell and wife, Mrs. Pomeroy, Alice Runyan, Mabel Hart, Mabel Moore, Mrs. D. J. Collver, Mrs. Alex. Hoyt, Belle Adams, Sue DeWitt, Helen Watterson, F. W. Hart, Will Hart, J. D. Gilchrist, Horace Robbins, Frank Osborn, Gardner Dodge, Will Gilchrist, John S. Watterson, Mose Watterson, Will Curtis, Ralph Hadlow, W. R. Hunt, James Norris, Lee Wallace, J. Lanarchi, of Cleveland; Mrs. F. W. Gilchrist and Miss Grace Gilchrist, of Alpena; Mason Misner, of Erie; Captain Blatner and wife, of Vermillion; J. E. Schuck and R. E. Schuck, of Sandusky.

TOLEDO.

Special Correspondence to The Marine Record.

Capt. L. S. Sullivan closed a deal a few days since by which another tug will be added to his fleet at Buffalo. His latest acquisition is the Paddy Miles, an iron boat with 14x16 engine that carries 130 pounds of steam. She will prove a valuable addition to the Independent Towing Co.'s fleet. With her, the company now has the Pallister, Butler and Delta at Buffalo.

The Lake Michigan & Lake Superior Transportation Co. has sent out official notice to the effect that the first steamer will leave Chicago for Lake Superior ports April 15th, and regular sailings will be Wednesday and Saturday evenings during the season.

GREAT CHAIN COMPLETED.

The Standard Chain Co., with headquarters in Pittsburgh, has just completed at its works in Lebanon, Pa., the longest and most powerful chain ever produced. A duplicate is to be made, the two for the Eastern Ship Building Co., New London, Conn. They will be used on two great vessels, to ply between San Francisco and ports of Japan.

The completed chain is of 330 fathoms, and an expert of the British Lloyds Register Association has witnessed the test. When the order was placed it was generally contended that the chain would have to be secured abroad, that the makers here could not supply a chain of the character required.

The chain was subjected to the strain of a new 600,000 pound testing machine at the works by the Philadelphia Machine Tool Co., Philadelphia. The tests were made in the presence of W. Gordon Minchin, of London, surveyor of the British Lloyds Register. Experts throughout the country and in Europe were waiting for the result of the test.

STAGES OF THE WATER FOR MARCH.

The gage records of the United States Lake Survey show the following mean stages of water for March, above mean sea-level: Lake Superior 601.41 feet; Lakes Huron and Michigan 579.27 feet; and Lake Erie 571.04 feet. These stages show Lake Superior to have been 0.31 foot lower than during same month last year, and 0.14 foot lower than in March, 1895; Lakes Huron and Michigan were 0.51 foot lower than during the same month last year, and 0.12 foot lower than during March, 1895; Lake Erie was 0.07 foot higher than during same month last year, and 0.06 foot lower than during March, 1895.

TO PROMOTE THE EFFICIENCY OF THE REVENUE CUTTER SERVICE.

The Senate bill to promote the efficiency of the revenue cutter service passed the House last week, 135 to 49. The opponents of the measure fought it to the last ditch. At the very end they attempted filibuster, but were swept aside by the overwhelming majority in favor of the measure.

The bill gives the commanding officers of the revenue service relative rank as follows: Captains, with majors in the army and lieutenant commanders in the navy; first lieutenants, with captains in the army and lieutenants in the navy; second lieutenants with first lieutenants in the army and lieutenants, junior grade, in the navy; third lieutenants, with second lieutenants in the army and ensigns in the navy. It gives the officers of the service longevity pay equivalent to their corresponding rank in the army, and provides for their retirement with three-fourths pay for disability or upon reaching the age limit of 64 years.

A SIXTEEN THOUSAND POUND ANCHOR.

The largest anchor ever forged has recently been turned out in the forging shop at Charlestown navy yard. It weighs 16,000 pounds, and the cost of material and construction is nearly \$2,000. Five men worked on it for over a month, hammering and smelting and welding it.

This great anchor is to form part of the equipment for one of the new battleships that are to be added to Uncle Sam's navy. The making of it was first tried as an experiment. It was not certain that an anchor of such size could be forged. Anchors of as great weight have been made of cast steel, and such are used on some ships of the American navy, as well as on British warships.

But, as cast steel is more likely to be broken, the navy officials desired to secure anchors of equal weight in wrought iron, and it has remained for the equipment department of Charlestown yard to prove that their manufacture is possible. So great has been the success of this experiment that the government has ordered twenty-two of equal size and weight to be furnished, two for each of the eleven first class battleships which are to be built.

The mammoth anchor, which, barring unusual conditions of undertow or violent storm, is sufficient to hold in her moorings the largest battleship afloat, is nearly fifteen feet in length from crown to shackle, and about nine and a half feet wide from one arm to the other. The heavy crossbar is also about fifteen feet in length. The palms, are about thirty-two inches in width.

A specially heavy chain cable, larger than any hitherto made is required to hold this anchor. The links of this cable, each of which weighs, when complete, over sixty pounds, require a gang of men to pound and weld and smelt for a half hour in the joining of each one. Three hundred and sixty fathoms of this immense chain will be required for each anchor.

The officials of the equipment department in the navy yard are especially busy now. They say that in the forge shop they have anchors enough now ordered to fill all their time for the next four years. The steam hammer which is used in forging the anchors gives a stroke of eleven tons. The officials hope soon to have one giving a stroke of twenty-five tons. With that, they claim, they can get on much faster.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS.—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., April 7, 1902.

LAKE ERIE.—BAR POINT SHOAL LIGHT-VESSEL STATION. Notice is hereby given that on the opening of navigation, 1902, a gas buoy, painted black, and showing a fixed white light during periods of ten seconds separated by eclipses of ten seconds' duration, will be temporarily placed on this station, until light-vessel No. 59, now undergoing repairs, can be completed and replaced on the station, of which due notice will be given.

The station is off Bar Point Shoal, northwesterly part of Lake Erie, at the mouth of Detroit river, and about one and a half miles to the southward and westward of Bar Point, Canada.

DETROIT RIVER.—LIMEKILN CROSSING SOUTH LIGHT-VESSEL.—Notice is hereby given that on the opening of navigation, 1902, relief light-vessel No. 63 will be temporarily moored at the westerly side of the southerly end of Limekiln Crossing dredged channel, lower part of Detroit river, in place of light-vessel No. 64, now undergoing repairs. Due notice of the replacement of light-vessel No. 64 will be given.

Relief light-vessel No. 63 will show, the same as light-vessel No. 64, a fixed white lens-lantern light, but both ends of the vessel are painted red and the center part is white.

This notice affects the "list of lights and fog signals, northern lakes and rivers, 1902," pages 34 and 38, Nos. 136 and 153, and the "list of beacons and buoys, northern lakes and rivers, 1902," page 49.

By Order of the Light-House Board.

N. H. FARQUHAR,
Rear-Admiral, U. S. Navy, Chairman.

OCEAN CABLES.

Dr. Maynard, curator of mechanical instruments in the National Museum, has quite recently placed on exhibition in the hall devoted to mechanical curios a short section of the old Atlantic cable, the first one that was laid down between Newfoundland and England by the steamer Great Eastern, in addition to this he has also placed on exhibit several sections of the second Atlantic cable, laid in 1881, and which was presented to the museum by the Western Union Telegraph Co.

Several years after the first Atlantic cable was laid many imperfections were discovered in its construction. This first cable was of the same diameter from one end to the other, and, while this was all well enough in deep sea, it was far from being heavy enough at the shore ends to resist the masses of floating ice, seaweed, icebergs, and currents that strained, twisted, and tore the cables to such an extent as to keep a force of men constantly employed making repairs on it.

To remedy this, a new and perfected cable was made and laid in 1881, between Dover Bay, Nova Scotia, and Whitesand Bay, Cornwall, England. This new cable (the one now in operation), is three inches in diameter at the Nova Scotia shore end and narrows down, through six successive stages; the "heavy shore, light shore, heavy intermediate," to the seventh, or "deep sea diameter," of less than one inch occupying the deep trough of the Atlantic ocean. Then it begins to thicken through all the stages above mentioned, but in inverse order, from the deepest part of the Atlantic to the point where it terminates in the cable station at Whitesand Bay, on the coast of Cornwall, England.

The deepest part of the Atlantic ocean is where the cable is least disturbed, or, in other words, where the likelihood of disturbance is the least; but as it nears land in either direction the danger of its being disturbed, cut, ground, twisted, snarled and broken by currents, icebergs, etc., increases, and this is why the present cable is thicker and heavier in such places than it is in deeper water, in order that it may successfully resist all dangers of this sort.

The copper wire over which the news of the Old and the New World travels remains, however, the same throughout the entire length of the cable, the protecting jacket and insulation alone varying in thickness and diameter according to the location and depth of the sea. The insulation of the copper cable wire remains of the same materials throughout, decreasing in mass and size from shore to deep sea. This insulation protecting the cable wire is as follows:

The copper wire is first inclosed in a tubing of gutta percha, around which comes a layer, or thickness, of small steel wires. Over these is a wrapping of jute fibre saturated in a waterproof compound which, in turn, is inclosed in a casing of armor of heavy steel wires. Over these follows the last coat, consisting of a jacket made of hemp fibre, tar and other cements, and which resembles patent leather. It is absolutely waterproof, and a thousand years' exposure to the briny fluid of old ocean would not be sufficient to tarnish, much less to rot, this particular covering, the process for making which is a secret.

IMPROVEMENTS IN OPEN HEARTH PROCESS.

William B. Hughes, of Philadelphia, has just patented a process for the manufacture of open-hearth steel to increase production without the necessity of using furnaces of inconveniently large capacity. This he proposes to attain by pre-melting, outside of the furnace, oxide of iron mixed with lime to form a highly oxidizing basic slag and bring the slag into contact with the molten iron on the hearth of the furnace. To work furnaces to their maximum capacity, and render unnecessary the use of large and expensive furnaces, the inventor expects to avoid the waste of time heretofore required for heating the basic additions by premelting the oxide of iron and lime in a separate furnace, accomplishing the removal of silicon and phosphorus without risk of injury to the hearth or lining such as is likely to result when the oxide of iron and lime are melted in the furnace. The molten slag is said to act more uniformly than if its constituents were charged into the furnace cold and in the reaction and discharge of slag the loss of uncombined oxide is prevented. Any type of open hearth furnace may be used provided with means for withdrawing metal and slag, a basic-lined furnace of the tilting type, being, however, preferred. The operation is started in the ordinary way, and after the metal has been properly purified by the extraction of silicon, phosphorus, and other impurities, almost all of the slag is withdrawn, and the remaining metal charge heated to the tapping temperature, at the same time properly reducing its carbon contents, making such additions as may be necessary for this purpose. Then a portion of the purified charges is withdrawn, and into the furnace is poured a proper charge of molten pig-iron, blast furnace metal, or the like, and while it is being charged, or immediately after, there is poured into the furnace the desired quantity of the highly-oxidizing liquid basic slag, the result being a quick reaction, which effects rapid elimination of the impurities and the ejection of a large amount of slag from the metal bath.

This slag, or almost all of it, is then withdrawn, so that the flame can act most effectively upon the metal remaining in the furnace for the purpose of raising its temperature to the tapping point, the removal of the remaining metalloids and the reduction of the carbon contents to the required percentage being at the same time effected, and additions made to accomplish this result. After the operation any portion of the finished charge is withdrawn and the operations repeated indefinitely.

Another improvement in the manufacture of open hearth steel has been made by William White, Jr., of Pittsburg, which has for its object the shortening of the time required for the elimination of silicon, carbon, phosphorus, etc., from the metal and a more perfect control of such elimination. Under usual practice it is impossible to make more than twelve to eighteen heats a week, dependent upon the percentage of silicon, carbon, etc., in the metal, and the extent of elimination required.

It has been attempted to employ Bessemerized metal in the open hearth process, the silicon, carbon, etc., being eliminated so far as possible in the converter and the metal transferred to the open hearth for further treatment. This has not been practically successful as the metal is too hot after treatment in the converter, and the temperature is increased so rapidly by the oxidation of the silicon that it passes beyond the desiliconizing temperature before all or the desired percentage of silicon is eliminated, so that the metal when transferred to the open hearth is too high in silicon, and the excess must be removed in the open hearth.

In Mr. White's invention molten metal at a desiliconizing temperature is charged into a converter and blown to effect an elimination of the silicon. In the oxidation of the silicon from a fifteen ton charge containing two per cent. silicon between nine and ten million heat units will be developed by the continuation of the blast for ten minutes. This heat, unless neutralized, would soon raise the metal beyond the desiliconizing temperature, i. e., to a temperature at which the oxygen has greater affinity for carbon than silicon—and that before silicon has been sufficiently eliminated. Hence the inventor provides for maintaining the metal at a desiliconizing temperature until the carbon lines in the spectrum show that elimination of carbon is actually progressing. A convenient means of preventing an injurious or detrimental increase of temperature by the burning of the silicon consists in forcing steam into the converter with the air.

Discussing the above inventions the American Manufacturer says the outline of the patents just issued to a couple of inventors covering portions of the open hearth steel process indicate only faintly the interest in the further advancement in that department of steel production. The open hearth process has narrower limitations than is generally supposed except to those in hourly contact with the system. If the facts were otherwise there is no doubt the production of open hearth steel would be far in advance of its present position.

There are points in open hearth practice beyond which it is practically impossible to move. Strictly it should be said that it is so undesirable that the practice becomes in effect impossible.

Contrary to ordinary practices in steel production, the producer cannot increase his output in the same ratio by simply enlarging his furnace capacity. That is to say the producer of open hearth steel cannot increase his production to 100 tons by simply enlarging his 50-ton furnace to that size without assuming a number of risks to the furnace, in addition to assuming an extra cost in production

far in excess of the ratio between the two productions.

The larger the open hearth furnace the greater the extra risks and relatively higher, as the capacity increases, becomes the cost of production and maintenance of furnace. In other words, the large open hearth furnace is undesirable, leaving any increase in the productive capacity solely to be reckoned with through a greater number of smaller capacity furnaces. The chief difficulty and source of expense comes through the high temperatures necessary for the operation of open hearth furnaces of large capacity.

The distribution of the heat always has the effect of destroying the walls, and instances have been many of large sized open hearth furnaces dropping their tops during the second heat. Unless some of the latest inventions overcome the objections to large capacity furnaces the future of heavy production in open hearth seems to depend upon a large number of small furnaces.

In its current issue Tin and Terne also discusses editorially, basic open hearth work, especially in reference to the use of phosphorus pig. It says:

The basic open hearth steel process has been undergoing some radical changes since it came into prominence only a few years ago. It will be remembered that originally the process was regarded as valuable chiefly from its ability to eliminate phosphorus and to use large percentages of scrap in the charge. The first employment of the basic open hearth steel process on a large scale in the Pittsburg district involved the use of Alabama pig iron which could be had at a very low price, because its phosphorus content made it of value for any other purposes. At the same time it was expected that the utilization of large quantities of scrap, especially the scrap which originated in Bessemer works under the same ownership, would be the principal function of the process, and a basic open hearth steel plant was regarded as properly merely an adjunct of a large Bessemer plant. The development of only a few years has entirely changed the aspect of affairs. The basic open hearth process has shown such economy that it has come to stand on the same level as the Bessemer process, and concurrently with this the Bessemer process has of course, lost its unique position. The advantages of using a comparatively low phosphorus pig iron in the basic open hearth process have been found to be of sufficient moment to induce the use of standard Bessemer or Bessemer "off" in phosphorus or silicon in that process as well.

At the present time the largest producer in the Pittsburg district is using large quantities of Bessemer pig in the regular basic open hearth process, the proportion of Bessemer being fully 30 per cent. of the total pig iron charge. Another large producer is using considerable quantities of what is practically Bessemer iron, and the average phosphorus in all the iron used is only about 20 per cent. This is all "direct metal," the iron not being allowed to cool from the blast furnace to the steel furnace. Smaller open hearth steel makers, who use cold iron, are buying Bessemer whenever the terms are favorable, and it can be had cast in chills. It is, of course, practically impossible to use said cast pig, either Bessemer or basic, in the open hearth furnace.

The employment of pig iron lower in phosphorus than that at first used came more as a matter of necessity than as a convenience or an economy. Commercial basic pig iron was at first defined as an iron containing less than 1 per cent. of phosphorus, with other limitations. While it is only possible to eliminate from 50 to 65 per cent. of the phosphorus in the pig, when large quantities of scrap are employed, the remaining portion of the phosphorus of the pig is largely diluted, the scrap, of course, containing much less phosphorus than the pig. But as the supply of scrap was diminished by the growth of the open hearth process, the necessity of using a larger percentage of pig iron grew, and with a larger percentage of pig charge came the necessity of reducing the amount of phosphorus content. It is, therefore, now the rule rather than the exception, for the buyer of basic pig to require that it shall not run over .75 or .8 per cent. in phosphorus. A lower phosphorus is of course, preferable in such cases, but higher phosphorus is regarded as inadmissible.

In the case of steel for sheets, a certain percentage of phosphorus is desirable, as it prevents sticking, but the requisite amount can be had with an ordinarily low phosphorus. There are several advantages in the use of Bessemer, or slightly off Bessemer iron in the basic open hearth process. The principal one is that the reduced quantity of phosphorus requires less time to be eliminated and therefore conduces to more rapid working.

The rapid driving of all blast furnaces has resulted in the past few years in bringing down the silicon, and where formerly it was not necessary to specify a lower limit for the silicon content of Bessemer iron, it has within the past year or two become the rule to require that the silicon shall not run below 1 per cent., the commercial definition usually being that it shall be between 1 and 2 per cent. Formerly the silicon naturally ran over 1 per cent., but with the large, modern furnaces and heavy blowing capacity, Bessemer iron running only say .75 per cent. silicon became so common as to seriously interfere with the proper working of the Bessemer process.

The tendency remains for the blast furnace running on Bessemer ores to put the silicon below 1 per cent., producing an "off" iron. This "off" iron running lower in silicon than the Bessemer limit, is particularly advantageous in the basic open hearth process. While a regular Bessemer iron is more desirable than a regular basic, an off Bessemer

running low in silicon is still better, as the silicon is hard on the furnace and means an extra expense.

There is reason to believe that the low phosphorus ores of the Lake Superior region will not be saved for the Bessemer process, but will be employed as practice demands for the basic open hearth process as well. The recognition of the facts that the Bessemer process has not of late shown the same growth that characterized former years, has reduced the differential between the cost of Bessemer and non-Bessemer ores in the market, and the natural result is an increased use of the former. The use of Bessemer iron in the acid open hearth process, it must be remembered, is also an important feature, as our production of acid open hearth steel reaches not far from a million tons a year.

The foregoing refers in particular to the production of mild steel in the basic open hearth furnace. Where a high carbon steel is made the use of Bessemer iron is almost absolutely necessary. To eliminate all the phosphorus possible, where the phosphorus content runs high, say above 5 per cent., it is necessary to prolong the reaction, and meanwhile the carbon disappears entirely, so that recarburization is necessary, and in this recarburization, when a high carbon is desired, there is introduced an undesirably high percentage of manganese. For the production of a high carbon steel, therefore, it is desirable to use low phosphorus pig, which can be purified before the carbon has entirely disappeared, and therefore requires less recarburization and less addition of manganese.

SELECTING LUBRICATING OILS.

Oil intended to lubricate bearings, slides and other rubbing surfaces should be invariably pure mineral oil, devoid of any vegetable or animal fat. Vegetable oils have no lubricating properties whatever, and oxidize at a comparatively low temperature, becoming thick and gummy; animal oils also thicken and become sticky and gummy when exposed to the influence of the atmosphere and the warmth of rubbing surfaces. Animal and vegetable oils are often compounded with a mineral oil in order to produce an engine oil having high viscosity and fire test; such compound should never be accepted at any price. In order to test engine oil for "loading," put a little caustic soda or soda ash solution in the oil and shake it up. If it clouds up and looks soapy this is an indication of animal oil.

Paraffine is also highly objectionable. A convenient test for paraffine is to put a bottle of the engine oil on ice for fifteen or twenty minutes; if the oil becomes cloudy, it is loaded with paraffine and should be rejected without further argument or investigation. Engine oils having an opalescent green tinge when held up to the sunlight instead of appearing clear yellow or red, are adulterated with either kerosene or some lighter hydro-carbon, which is not a lubricant and which volatilizes as soon as it is warmed by the friction of the bearings. Any engine oil, therefore, which has the slightest tinge of opalescent green should be rejected. Engine oils for high speed should show a viscosity of at least 170 and should range from that point up to 195 at an ordinary temperature, say 75°. The oil should have a specific gravity of about 30; it should not be under 29 nor over 31. The flash test should be between 400° and 440° Fahr.

Cylinder oils for use in connection with a cylinder where the steam pressure is less than 100 pounds per square inch should show a fire test not less than 590° nor more than 630°. For pressure over 100 pounds and up to 200 the viscosity should be from 640° to 660°. The specific gravity of a cylinder oil showing a fire test of 600° should be from 26 to 27, and for a fire test of 660° the specific gravity should be about 24 or 25. Unless there is considerable moisture in the cylinders, cylinder oil should not contain any animal oil, and vegetable oil should not be used under any consideration. If animal oil should be necessary, acidless and refined tallow oil should invariably be used. For steam pressures of 100 pounds or less, 8 to 10 per cent of tallow oil may be compounded with mineral cylinder oil, and for pressures of 100 to 200 pounds, 3 to 6 per cent may be used. Common lump tallow should never be used for compounding, as it contains acid which attacks the metal of the cylinder walls and leaves charred particles in the steam.

An adulteration commonly found in cheap grades of cylinder oil is wool fat, which is used to cut the gummy ingredient and give the oil a good flow in a cold test. Wool fat causes separation and a thick deposit in the bottom of the barrels, and results in the same charred deposit in the cylinder as lump tallow.

THE American Manufacturing Co., 65 Wall street, New York, is issuing a very handsomely and profusely illustrated booklet entitled "A Little Blue Book On Rope Transmission," printed with unusual taste in two or more colors, and is bound in a neat blue paper cover. The subject matter covers not only the subject of rope transmission, but gives a great deal of information regarding the material used by the company in manufacturing rope and cordage, and the manner in which the manufacturing is done is fully illustrated. There is also much information regarding splicing, etc. So popular has this book been that this is third edition that it has been necessary for the company to issue. Copies will be sent free to our readers who refer to the MARINE RECORD.

TREASURY DECISIONS.

TREASURY DEPARTMENT, April 3, 1902.
PRESENTS IN PASSENGERS' BAGGAGE.

Articles intended for distribution as presents, contained in the baggage of persons arriving in the United States, are not entitled to free entry under paragraph 697, act of 1897.

Before the U. S. General Appraisers at New York, March 29, 1902.

In the matter of the protest, 80432/-18145, of J. McDonald Peacock, against the decision of the collector of customs at New York, N. Y., as to the rate and amount of duties chargeable on certain merchandise, imported per La Bretagne, and entered December 17, 1900.

Opinion by SOMERVILLE, General Appraiser.

The appellant in this case protests "against the payment of duties" on certain articles contained in his personal baggage, which he concedes in the protest and in letters to the Board were intended for Christmas presents for his friends. The local appraiser's return describes the goods as "beaded articles, \$60," and as "manufactures of metal, \$1.00," and there is no further evidence of their character. Appellant arrived on the steamer Lucania, on December 8, 1900, and his baggage on December 9, by the La Bretagne. This delay, however, being caused by the failure of a French railway to forward the baggage in time for the Lucania, and through no fault of the protestant, is no detriment to his rights, if, as seems probable from the record, he be an American resident. (In re Wyman, G. A. 5109.)

There is no affirmative request for relief in the protest, and no paragraph is named as supplying a classification more appropriate than that adopted by the collector. But if we construe this protest to have the precision required by law, and refer it to paragraph 697 of the tariff act of 1897, and if it be further conceded that the nature of the articles would otherwise entitle them to free entry, we are of opinion that no construction can be given to paragraph 697 which would extend its benefit to articles intended for distribution as presents.

The body of the paragraph is limited to such articles as "are in the use of" arriving passengers, and, by its express terms, "shall not be held to apply to merchandise or articles intended for other persons or for sale." But under the doctrine of United States vs. One Pearl Necklace (111 Fed. Rep., 164), the privilege of returning residents of the United States, with respect to personal baggage, must be sought exclusively in the proviso, which reads, so far as pertinent, as follows:

Provided, That in case of residents of the United States returning from abroad, all wearing apparel and other personal effects taken by them out of the United States to foreign countries shall be admitted free of duty, * * * but no more than one hundred dollars in value of articles purchased abroad by such residents of the United States shall be admitted free of duty upon their return.

"Wearing apparel and other personal effects" was construed by the Board in re Wyman (G. A. 5109) to embrace the ordinary baggage of passengers. But the accepted definitions of "baggage" confine the term "to that which is personal to the passenger and carried for his use or convenience," and exclude those things intended "for larger or ulterior purposes." (Macrow vs. Railway Company, L. R. 6 Q. B., 612; Story on Bailments, sec. 499.) As thus stated, its meaning will not admit presents intended for other persons, and the courts have so held. Otherwise, as was said in one case, "it would be almost impossible to lay down any rule of limitation, either as to quantity or value." (Navins vs. Bay State Steamboat Company, 4 Bosw. N. Y., 225; The Ionic, 6 Blatch., 538.)

The precise question, however, is whether the term "articles purchased abroad," in the last clause of the proviso, has any broader meaning than the phrase just discussed. We think not. No different construction could be given it without exempting any merchandise enumerated in the tariff act, to the value of \$100, when brought by residents. Such a result is repugnant to the intent of the paragraph as a whole, which was clearly framed for the accommodation of travelers as such, and is not compelled by the language if we apply the doctrine of noscitur a sociis. This view aims at a construction "which will carry out the spirit and intent of the entire provision of the statute, and, while it comports with the ordinary habits of passengers and travelers, will not open the door for fraud." (Blatchford, J., Astor vs. Merritt, 111 U. S., at 214; T. D. 18928.)

The protest is overruled and the collector's decision assessing duty under various paragraphs is affirmed.

Fruit vessels plying between infected or suspected fruit ports and ports of the United States.—Amendment of circular 134 of 1900.

TREASURY DEPARTMENT,
OFFICE OF SUPERVISING SURGEON-GENERAL, M. H. S.,
WASHINGTON, D. C., April 1, 1902.

To United States consular officers, masters and owners of vessels, collectors of customs, and others:

In view of the fact that five days' detention is considered sufficient in the case of passengers on fruit vessels leaving uninfected fruit ports of Central and South America for ports of the United States, paragraph 7 of Department Circular No. 134, dated August 31, 1900, entitled

"Special regulations for the government of vessels plying between infected or suspected fruit ports and ports of the United States," is hereby amended by substituting the word "five" for the word "ten" wherever the latter occurs in said paragraph.

Approved: WALTER WYMAN,
Surgeon-General M. H. S.
L. M. SHAW, Secretary of the Treasury.

Inspection of foreign steam vessels and collection of fees therefor under certain conditions.

TREASURY DEPARTMENT, April 1, 1902.

To supervising and local inspectors of steamboats, collectors and other chief officers of customs, and others whom it may concern:

The following act of Congress is published for the information and guidance of all concerned:

An Act to amend section forty-four hundred of the Revised Statutes of the United States, relating to a reciprocal recognition of boiler-inspection certificates between the several maritime nations having maritime inspection laws.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-four hundred of title fifty-two of the Revised Statutes of the United States be, and the same is hereby, amended by adding to said section, as amended by the Act of Congress approved March first, eighteen hundred and ninety-five, chapter one hundred and forty-six, page six hundred and ninety-nine, volume twenty-eight, United States Statutes at Large, third session, Fifty-third Congress, after the word "aforesaid," a provision as follows: Provided, however, that when such foreign passenger steamers belong to countries having inspection laws approximating those of the United States, and have unexpired certificates of inspection issued by the proper authorities in the respective countries to which they belong, they shall be subject to no other inspection than necessary to satisfy the local inspectors that the condition of the vessel, her boilers, and life-saving equipments are as stated in the current certificate of inspection; but no such certificate of inspection shall be accepted as evidence of lawful inspection except when presented by steam vessels of other countries which have by their laws accorded to the steam vessels of the United States visiting such countries the same privilege accorded herein to the steam vessels of such countries visiting the United States; it being further provided that there shall be collected and paid into the Treasury of the United States the same fees for the inspection of foreign passenger steamers carrying passengers from the United States that any foreign nation shall charge the merchant vessels of the United States trading to the ports of such nationality; it being further provided that the Secretary of the Treasury shall have the power to waive at any time the collection of such fees upon due notice of the proper authorities of any country concerned that the collection of fees for the inspection of American steam merchant vessels has been discontinued.

Approved, February 15, 1902.

Local inspectors of steamboats are hereby informed that, until officially notified by this Department to the contrary, they must continue to inspect and certificate, as formerly, all foreign steamers carrying passengers from ports in the United States (including the Hawaiian Islands and the island of Porto Rico).

In view of the fact that the Dominion of Canada, under an act (61 Victoria, ch. 46) entitled "An Act respecting the inspection of steamboats, and the examination and licensing of engineers employed on them (assented to June 13, 1898)," charges an inspection fee of \$8, and 8 cents per ton additional, for each merchant steamer of the United States inspected by its officers, except in the Province of Ontario, collectors of customs will, until further notice, collect from all steamers owned in either of the provinces of the Dominion of Canada requiring inspection by the United States inspectors of steamboats the same fees as charged by the inspectors of the Dominion government for the inspection of merchant steamers of the United States.

Collectors of customs are further directed to withhold in all cases, until such fees are paid, the copies of certificates required to be issued to such steamers under the provisions of section 4421, Revised Statutes, such fees, when collected, to be paid into the Treasury of the United States under such regulations as shall hereafter be prescribed by this Department.

When the fees above referred to have been received by the collector or other chief officer of customs, that officer will give the master, agent, or owner of such steamer a receipt therefor.

O. L. SPAULDING,
Assistant Secretary.

Shipping.—Injury of Workman.—Liability of Ship.—The owners of a ship are liable for an injury to a carpenter, employed by a firm which had been hired to make repairs or changes in the interior of the ship to fit it for cargo, and who was sent on board to work during the night, and fell through a hatchway in a dark and unusual place, which had been negligently left open, without notification or warning to those who were doing the work. West India & P. S. Co., Limited, vs. Weibel 113 Fed. Rep. (U. S.) 169.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Grant of Land Below High-Water Mark.—The state, having granted in fee a strip of land under water, extending out 400 feet from high-water mark, cannot thereafter give another the right to erect a public dock thereon. De Lancey vs. Wellbrock et al., 113 Fed. Rep. (U. S.) 103.

Admiralty.—Salvage Award.—Interest.—Where a libellant made greatly exaggerated and unwarranted claims for salvage services and towage, he will not be allowed interest on the amount awarded. Merritt & Chapman Derrick and Wrecking Co. vs. Chubb et al., 113 Fed. Rep. (U. S.) 173.

Boundary.—Land Below High-Water Mark.—The in-shore boundary of a grant of a strip of land below high-water mark, 400 feet wide, changes with the high-water mark, the shifting of the shore being from natural causes. De Lancey vs. Wellbrock et al., 113 Fed. Rep. (U. S.) 103.

Admiralty.—Pleading.—Waiver of Misjoinder.—Where no exceptions are taken to a libel in which separate claims for salvage and towage services against different defendants are joined, objection to the misjoinder is waived. Merritt & Chapman Derrick and Wrecking Co. vs. Chubb et al., 113 Fed. Rep. (U. S.) 173.

Salvage.—Suit for Compensation.—Decree as Between Defendants.—The pleadings and proofs in an action to recover for salvage services, in which judgment was rendered against an insurer which had contracted for the services. Held, not to authorize the court to decree the payment of such judgment by the company which owned the salvaged vessel, also a party defendant, on the ground that in another proceeding by it for limitation of liability it had been permitted to retain a sum deducted from the appraised value of the vessel to pay the claim of the salvors. Merritt & Chapman Derrick and Wrecking Co. vs. Chubb et al., 113 Fed. Rep. (U. S.) 173.

Railroads.—Drawbridge.—Failure to Open.—Loss of Vessel.—Evidence.—Question for Jury.—Where, in an action against a railroad company for failure to open a drawbridge, whereby a schooner was prevented from passing to a place of safety, and was lost, the captain and two or three persons on board testify that the bridge tender was continually signalled to open the draw by the blowing of the conch shell, which was often used for that purpose, and which could be heard from one and one-half to five miles, according to the state of the atmosphere, and an equal or greater number of witnesses for defendant testified that they heard no signal, the questions whether the signals were given, and whether they could be heard in the storm then raging, were for the jury. Louisville & N. R. Co. vs. McDonald, 31 So. Rep. (Miss.) 418.

Navigable Waters.—Dumping of Refuse Matter.—Indictment.—Sufficiency.—An indictment based on Act June 29, 1888, (25 Stat. 209), as amended by Act August 18, 1894, (28 Stat. 360), charged that M., being the owner, and R., being the master of the steamer, "did unlawfully dump" and "aid and abet in the dumping" of refuse matter, "into the tidal waters of the harbor of New York, and the waters adjacent thereto;" the place being "at the Southern District of New York, within the admiralty and maritime jurisdiction of the United States, and within the jurisdiction of this court." Act March 3, 1899, prohibited the discharge of refuse into any navigable waters of the United States, etc. Section 16 declared that any master, pilot, or engineer, etc., who should knowingly engage in towing any vessel loaded with refuse matter to any point of deposit in any harbor or navigable water elsewhere than in certain prescribed limits, should be guilty of a violation of the act. Held, that the indictment charged an offense within the act of 1899, as well as within the act on which it was based, and therefore that the court would not consider whether the earlier acts were repealed by the act of 1899. United States vs. Moran et al., 113 Fed. Rep. (U. S.) 172.

PRODUCTION OF MANGANESE.

The production of manganese throughout the world is increasing at a rate at least commensurate with the growth of the demand for it. As our readers know, its use has expanded very materially in recent years, in connection with the manufacture of Bessemer and open-hearth steel, but the element is of tolerably wide distribution in localities where it is capable of easy working, in relation to the consuming centers, and there is no reason to fear for a failure of supplies in the years to come. On the contrary, the development of new mines promises to lead to a plethora, and consequently to a serious fall in prices, unless the manufacture of steel grows pari passu with it, which seems improbable. It is estimated that the world's production during the last year was close upon 900,000 tons, of which over 430,000 tons were supplied by Russia, 120,000 tons by Spain and Portugal, 83,000 tons by India, and the remainder by other countries among which Brazil leads with a round 70,000 tons. The Russian contribution forms the backbone of the whole annual supply. It comes mainly from the Trans-Caucasus.—London Engineering.



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CLEVELAND, O., APRIL 10, 1902.

MACHINIST APPRENTICE SYSTEM FOR THE NAVY.

BY LIEUT. T. W. KINKAID, U. S. N.

In the naval service technical difficulties are not the only ones that confront the chief engineers of our ships. No matter how high his professional and executive ability, the officer is hopelessly handicapped if he have not the proper men to do his bidding. Firemen, oilers and water tenders can be trained from raw material in a reasonably short period; but machinists, of whom our larger ships require as many as twelve or more, are not to be had in sufficient number. A fine ship without a proper complement must be considered a "lame duck."

It is not surprising that young men with good shop training are not desirous of going to sea as enlisted men. The inducements in the matter of pay are not great, as the first compensation is only \$40 per month. Even after a considerable lapse of time, the machinist, second class, cannot be rated higher pay unless a vacancy should occur on the ship to which he is attached. Finally, when, partly by virtue of merit and partly by lucky chance, he steps into a vacancy in the chief machinist rating, his pay is only \$70 per month, which is little enough for a skilled man who gives up home comforts and associations, and has to perform much of his duty at night and on seven days of the week.

The establishment of the rank of warrant machinist has done something toward inducing good machinists to enter and remain in the service; but the number of such prizes is limited, and the efficiency of warrant rank as a drawing card is limited correspondingly.

I have always thought that one of the most potent causes of discontent among the enlisted men, especially the intelligent men in the higher ratings, has been the utter lack in naval regulations of any provision for their shore duty. Going to sea, with occasional liberty in domestic and foreign ports, may constitute a satisfactory career in the eyes of the younger men of the service, but there comes a time in the life of every man before the mast when continuous sea duty becomes monotonous. At this juncture many good men fail to re-enlist, and, having once obtained a footing on shore, they remain permanently out of the navy. Matrimony plays a prominent part in taking men from the service. It is natural, of course, that men should wish to marry, but without shore duty married life is practically impossible.

The question: "What shore duty would you give, these men?" is easily answered. Most of the machinists on shore duty could be profitably employed at our navy yards, in the shops and on ships under repairs; others would be extremely useful as assistants to inspecting officers at shipyards, steel works, ordnance factories, and so forth. Those employed at navy yards should have quarters in barracks; those on detached duty should receive commutation for quarters and rations.

Even if the allurements of shore duty were offered, I believe that there would still be a dearth of machinists; and

I am satisfied that the most practical method of supplying the deficiency would be through the agency of a properly organized and administered apprentice system. I believe that we should take in our men as we do our officers—while they are young. It is a well known fact that under the old apprentice system trades were but slowly learned, because frequently the master had a selfish interest in retarding the advancement of his pupil. But it is safe to say, I think, that a system could be organized within the naval service that would give us well-qualified and well-disciplined young mechanics, fit for any machinist duty, afloat or ashore, at the end of three years of training.

Assuming such a system in existence, and the period of enlistment on probation as four years, the age limits at enlistment we may take at seventeen and nineteen years. The machinist apprentice should spend his first year at a navy yard, on the Atlantic or Pacific coast. The apprentice should be quartered in barracks. They should be divided into sections of about twenty boys each. The instruction at each yard selected for apprentice training should be under the supervision of a commissioned officer, assisted by two warrant machinists especially selected for the duty. A scheme of instruction and discipline, prepared under the supervision of the Bureau of Steam Engineering, should be incorporated in the navy regulations. An approved glossary of technical terms as used in the navy should be prepared for the instruction of the boys. The rating for the first year of service would be machinist apprentice, third class, and the pay might be put at \$16 per month.

In order to give the young apprentices healthful recreation within the limits of the navy yards, the barracks in each instance should adjoin a gymnasium equipped with the usual apparatus, and including baths, swimming tank and bowling alley. There should also be provided a reading room supplied with trade papers and other reading matter. The expense of the reading room equipment should be borne by the apprentices.

Should the machinist apprentice be retained in the service for a second year of instruction he should be given the next higher rating and the pay of \$30 per month. The second year should be spent at sea in the performance of the duties of oiler and machinist's helper. Machinist apprentices at sea should be in excess of complement.

The third and final year of instruction should be at a navy yard, with the rate of machinist apprentice, first class, and pay of \$40 per month. The rate of machinist, second class, should be abolished, and machinist apprentices, first class, should, after a year in their rating, be eligible for promotion to the rate of machinist, with pay of \$70 per month. Chief machinists should receive \$80 per month.

Quarterly reports as to aptitude, industry and general conduct should be made to the department, and apprentices falling below the standard, should be summarily dropped.

I have not outlined a course of instruction for the apprentices at navy yards. There are many officers in the service who are well qualified to devise a course in the machine shop, foundry, pattern shop, and so forth, and such a program would doubtless be forthcoming at short notice if required. Some instruction in the coppersmith's art would increase the all-round usefulness of the young machinist.

Finally, I think it is axiomatic that the more good men we get and retain in the service the more attractive will it become to the good men outside.

WATER LEVELS.

The stage of Lake Superior in March, 1902, by the U. S. gauge at Houghton, Mich., was 0.30 foot above low water datum. The lake has been falling during the past winter, as it usually does, but is now nearly stationary, being only 0.04 foot lower in March than for the preceding month, and probably at the lowest point for the season of 1902. The average time of lowest water for the entire year is about March 23.

The March stage of the lake was 0.22 foot lower than in March a year ago, but is 0.38 foot higher than the average March stage for a period of 26 years. Everything considered the present water level is favorable for navigation.

The melting of snow, the reappearance of rainfalls, and the opening up of ice bound streams and swamps, should soon start the lake on its annual rise, which usually commences during the month of April.

J. H. DARLING,
Assistant Engineer.

CABLE TO HONOLULU.

George G. Ward, of New York, vice president of the Commercial Cable Co., arrived in San Francisco a few days ago to select a landing place for the projection cable between the Pacific Coast and the Philippines. Mr. Ward is accompanied by Charles Curtiss, the company's chief electrician. While there Mr. Ward will consult with Mr. John Mackay, president of the company. Mr. Ward says: "We are going to build the cable irrespective of congressional action. The first link between San Francisco and Honolulu will be completed by the end of next October. The cable will be shipped from England next July. It has not yet been decided where we will land on this coast. It will either be at Monterey or this city, probably the latter."

LIQUID FUEL IN THE MERCHANT AND NAVAL SERVICES.

Whilst the advantages of liquid fuel, and the possibility of its successful mechanical use, have been generally admitted, little or no progress in its application has been made outside the Russian inland Caspian Sea until recently, says London Engineering, and the reason for this stagnation has been mainly of a commercial character. The supply of fuel outside of Russia has been but nominal, and no general application was possible. Such a condition of things never became possible until the recent discovery of the large supplies of oil suitable for fuel, first in Borneo and Burmah, and quite recently in Texas and California.

The whole aspect of the question, whether regarded by the Admiralty, the ship owner, or the naval architect, has been changed by the assurance of continuous supplies of liquid fuel; and it becomes necessary to treat the question, not only as of practical importance, but of urgency to those responsible for the highest efficiency of fighting and carrying ships. The British Admiralty has determined to exhaustively test the use of this newly resuscitated means of evaporation, not only in destroyers, but also in three cruisers and one battleship. The Italian Admiralty have been pursuing the question for some years, even before large supplies were assured. The German Admiralty have used liquid fuel on the China station for many months, in lieu of coal, for auxiliary purposes on board ship. The Hamburg-American Steamship Co. have fitted four steamers for liquid fuel, and the North German Lloyd two vessels. The Dutch navy have fitted liquid fuel apparatus in conjunction with coal to two destroyers, and Dutch mail and cargo steamers in the Far East have the new liquid fuel in regular use. Danish ship owners have ordered the building in Germany of two steamers to burn liquid fuel; and some twenty vessels under the British flag are now running regularly under liquid fuel; whilst at least a dozen are building with suitable fuel apparatus included in their design. It may be expected that the supply to many existing stations will be drawn as regards the ports east of the Suez canal from Borneo and Rangoon, and as regards those west of the canal and in South America from the Texas fields; South African stations being neutral as regards the heavy charges of the Suez canal, and therefore likely to draw their supply from Borneo or Texas with equal economy. The South American stations will no doubt be supplied from the Texas and California fields. The practical figures of comparison between coal and oil fuel realized in recent practice are that two tons weight of oil are equivalent to three tons weight of coal, and 36 cubic feet of oil are equivalent to 67 cubic feet of coal as usually stored in a ship's bunkers—that is to say, if the change of fuel be effected, the range of action is increased by 50 per cent. upon the bunker weight allotted, and nearly 90 per cent. upon the bunker space allotted. The ship's complement would be reduced by the almost complete abolition of the stoker element. Rebunkering at sea—so anxious a problem with coal—would be made easy, there being no difficulty in pumping from a store ship to a warship in mid-ocean in ordinary weather; 300 tons an hour is quite a common rate of delivery in the discharge of a tank steamer's cargo under ordinary conditions of pumping. The cost of fuel in the east is less than that of Welsh coal, when the cost of transport and Suez canal dues are added to the original price of coal as delivered in a Welsh port. The greatest commercial gain with merchant steamers is the increase of weight and space available for freight. Adopting the proportion of three tons coal as equal to two tons oil fuel, we find a gain weight of, say, 1,000 tons in the freight of a first class Atlantic steamer, and a gain of nearly the whole of the bunker space; there would be a gain approaching 100,000 cubic feet of measurement made available for freight in such a vessel. For most ships, 25 per cent. of the space now occupied by coal bunker storage could be utilized for cargo, by the transfer of the fuel in a liquid form to the double bottom and other parts not now of any direct use.

EASTERN FREIGHT REPORT.

Messrs. Funch, Edye & Co., New York, report the condition of the eastern freight market as follows:

The anticipated improvement in the demand for grain tonnage has not yet materialized, and it appears doubtful whether much business in this direction will be practicable until the opening of the lake navigation. Since our last report there has been only one grain fixture, and the rate accepted is if anything slightly in charterer's favor. Whilst there are a fair number of steamers offering for deals from Bay of Fundy ports, shippers are experiencing difficulty in providing prompt cargoes. Two or three fixtures have been effected for coals to Mediterranean ports, and although the rate obtained in two instances is slightly in advance of previous quotations, there is no great activity manifest. Charterers from the Gulf are inclined to operate on the basis of 8s. 9d to 9s. on net form of charter, but owners are holding out for a slight advance on these figures. Timber charterers from the Gulf continue to show indifference about making further commitments unless owners are disposed to make some concessions in the rates.

Business in sail tonnage continues of a slow order, but with very little tonnage forcing on the market, former rates are well sustained.

THE NEED OF AN EFFICIENT FOG SIGNAL ON SAILING VESSELS.

By B. B. BIERER, Lieutenant, U. S. N.

The following remarks are submitted to mariners in the hope that the great dangers attendant upon fog—the seaman's greatest enemy—may be minimized by the imperative introduction of an efficient fog signal upon sailing vessels. It is earnestly desired that those interested make such comment as they may desire to the Hydrographic Office.

The existing meager and inadequate rules and international laws on the subject make the demand by mariners for an efficient fog signal imperative. It is believed that an efficient fog horn or submarine signal can be produced or that, failing in this, sailing ships on the high seas should use in a fog, mist, or falling snow an explosive fog signal. The expense of any change will at once be considered, but need a vessel of twenty gross tons be required to make the same signal as a vessel of 500 or 1,000 gross tons? Should a fog signal be selected because it is inexpensive or because it is effective? Will a common lantern answer for a light-house?

Article 15 of the International Regulations for preventing collisions at sea provides that a sailing vessel of twenty gross tons and upwards shall be provided "with an efficient fog horn to be sounded by mechanical means, and also with an efficient bell." This article does not give the slightest indication as to what is to be regarded as an efficient fog horn. Is the present fog horn in use on board sailing vessels efficient—that is, does it give a timely notice of the presence of a ship in a fog? It is believed that the captains of vessels of various nationalities will say that the fog horns which pass the inspectors, and therefore conform to the above law, are not efficient, in that they do not prevent collisions in a fog. This state of affairs should not exist, and it lies with mariners, ship owners, underwriters, and the public in general to insist upon a change in the regulations respecting fog horns.

In the case of a steamer meeting a sailing vessel end on, or nearly end on, no matter what the steamer's speed may be, there is now no possible way, with the present fog horn, for the vessel under sail to make her presence known until all time for caution is past. An incident has been cited—and it is only an illustration of many similar cases—where a steamer and a sailing vessel collided in a fog. The steamer's whistle was heard on board the sailing vessel for twenty minutes before the collision, although those on board the steamer heard nothing. In the case of a steam vessel going at "moderate speed" and navigating with caution, the usual noises on board ship and those made by her moving through the water are considerable, and the effectiveness—efficiency—of a fog horn should be judged by the conditions which exist now, and not by the conditions existing fifty years ago. What was effective fifty years ago is not necessarily effective now.

Investigation and experiments have shown that the ordinary steamer moving at full speed will stop, after suddenly reversing her engines, in from four to five times her length, and when moving at "moderate" speed this is reduced by little. If the helm is put hard over the instant the engines are reversed, the vessel will have moved ahead about three times her length before stopping, and the ship's head will have changed about four points. These conditions exist in quiet weather and smooth sea. In a vessel of 500 feet length, the distance advanced will be 1,500 to 2,500 feet, or one-fourth to two-fifths of a mile, during the time from reversing the engines until the vessel is stopped. Those who are familiar with thick fogs and the present "efficient" fog horn in use on sailing vessels will realize the uselessness of stopping only after this distance has been covered, to say nothing of that covered by the sailing vessel, in the case of meeting end on. In many straits, channels, and other localities, owing to strong currents and other conditions of navigation, large steamers and vessels must move at considerable speed, and the fog horn of a sailing vessel must be effective or collision is unavoidable.

Mariners should not insist on the infallibility of their ears, but keep in mind the fact that sound is not always heard with the same intensity in all directions from its source. Some curious phenomena may be related in regard to fog signals; and experiments with the fog signals of light-houses have shown that, though the fog signal was in full operation, and that while there was no lack in the volume of the sound emitted by the signal, the sound was heard at some distances and was not heard at others, or was indistinctly heard where it should have been heard loudly, and loudly heard where it should have been heard indistinctly; in fact, at some points near by, the signal could not be heard at all—all this within reasonable earshot. A siren on the Atlantic coast has been heard eighteen to twenty miles to the windward in north-east gales and much less distance to leeward. Whatever the theory, whether there is a soundless zone, whether these phenomena are due to different densities in the strata of air or fog, or whether there is some other reason, the fact remains and is cited for the information of the mariner.

It is also difficult to determine the true or exact direction of the source of a sound which reaches the ear. A number of cases are on record where officers on the bridge of a vessel have differed as much as from five to eight points in their estimation of the exact direction of a fog

signal, and collisions have occurred in consequence of such errors.

Caution should be observed in a fog even with an efficient fog horn.

APRIL ASTRONOMICAL DATA.

Astronomical data for April, 1902, furnished the MARINE RECORD by the Washburn observatory:

All of the bright planets are situated now in the morning sky; but Mercury passes from the group through superior conjunction, April 28th, and Mars is very near the sun. Saturn, Jupiter and Venus form the brilliant group of planets in the southern sky. Their brilliancy and position east of the meridian are in the order named. Venus, the brightest, reaches its greatest distance west of the sun April 25th, and is diminishing in brilliancy.

A slight partial eclipse of the sun occurs April 7th, not visible in this region, and a total eclipse of the moon April 22d, visible only in the Old World.

The times of sunrise and sunset for the month are as follows:

	SUNRISE.	SUNSET.
April 1.....	5:35	6:17
April 11.....	5:18	6:29
April 21.....	5:01	6:40
April 30.....	4:48	6:50

The times of the moon's phases are:

New moon.....	April 8.....	7:50 a. m.
First quarter.....	April 14.....	11:26 p. m.
Full moon.....	April 22.....	12:50 p. m.
Third quarter.....	April 30.....	4:58 p. m.

The principal fixed stars visible in the evening hours during the month are:

To the west: Capella, Aldebaran, Castor and Pollux, Procyon, Sirius, and the bright stars of the constellation Orion. Near the meridian; Regulus. To the east; Spica and Arcturus.

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STATEMENT OF THE VISIBLE SUPPLY OF GRAIN.

As compiled by George F. Stone, Secretary Chicago Board of Trade April 5, 1902.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo.....	661,000	124,000	4,000	.....	293,000
Chicago.....	6,398,000	460,000	62,000	912,000	103,000
" afloat.....	416,000	260,000	133,000	20,000	.....
Detroit.....	189,000	86,000	3,000	36,000	2,000
Duluth.....	14,592,000	66,000	203,000	461,000	324,000
" afloat.....	73,000	.....	.....	.....	.....
Fort William, Ont.	4,713,000	.....	.....	.....	.....
Milwaukee.....	732,000	240,000	132,000	22,000	127,000
Minneapolis.....	12,980,000	35,000	123,000	37,000	13,000
Montreal.....	51,000	8,000	266,000	22,000	63,000
Port Arthur, Ont.	271,000	.....	.....	.....	.....
Toledo.....	54,000	704,000	430,000	151,000	.....
Toronto.....	18,000	.....	13,000	.....	31,000
On Canals.....	46,000	3,000	87,000	37,000	50,000
On Lakes.....	1,202,000	.....	.....	81,000	73,000
On Mississippi Riv.	40,000	21,000	25,000	.....	.....
Grand Total.....	48,410,000	8,508,000	3,300,000	2,016,000	1,455,000
Corresponding Date.					
1901.....	53,890,000	2,990,000	11,399,000	1,112,000	850,000
Increase for week.....	.....	.....	154,000	.....	.....
Decrease " ".....	1,205,000	291,000	.....	80,000	120,000

While the stock of grain at lake ports only is here given, the total shows the figure for the entire country except the Pacific Slope.

LAKE ERIE AND DETROIT RIVER RAILWAY.

The recent project of the Pere Marquette road to acquire the L. E. & D. R. Ry., has not been successful, the price offered not being equal to what is asked. F. H. Walker, president of the L. E. & D. R. Ry., recently met the principal stockholders in the P. M. road at New York, and discussed the matter with them. He stated the terms on which the L. E. & D. R. Ry. could be purchased, but the price asked was considered too high, and the proposal to buy was declared off. In a subsequent interview Mr. Walker stated that the L. E. & D. R. Ry. was a paying property, that the company was in no hurry to sell, and that if any prospective purchaser was not prepared to give the price asked, a deal could not be made, as the company had no intention of reducing the price. The company has a Dominion charter to extend its line from St. Thomas to opposite Buffalo, 115 miles through a level country which will permit the line to be cheaply constructed, and is therefore a valuable property to any United States company desiring a connection between the eastern and western states by the short route through Canada. If such a company wanting the line is not prepared to pay the price asked, the L. E. & D. R. Ry. will continue in business on its own account. It is understood that other companies besides the Pere Marquette have made offers for the line. The failure to effect a sale, we are informed, in no way affects the traffic agreement between the Pere Marquette road and the L. E. & D. R. Ry., and the operation of the projected car ferry between Sarnia and Port Huron. The L. E. & D. R. Ry. has completed its slip dock on the Sarnia side of the river and the P. M. road slip dock at Port Huron is expected to be completed in April. The G. T. R. Car Ferry International was purchased by the L. E. & D. R. Ry. for service between the two company's docks, and it will be put in service as soon as the dock at Port Huron is completed.

The L. E. & D. R. Ry. Co. is applying at the current session of the Dominion Parliament for an Act confirming the amalgamation of the Erie & Huron Ry. Co. with the L. E. & D. R. Ry. Co.; the ratification of the lease of the London & Port Stanley Ry., and for the rearrangement of the mortgage debentures of the L. and P. S. Ry. —Shipping World, Toronto.

TRADE NOTES.

THE firm of Joseph T. Ryerson & Son, Chicago, report a very active demand for improved labor-saving machinery for boiler shops and kindred industries.

SOME very attractive printed matter descriptive of their Preservative Coatings is being issued and mailed to prospective purchasers, by Edward Smith & Co., 45 Broadway, New York City, and 59 Market Street, Chicago.

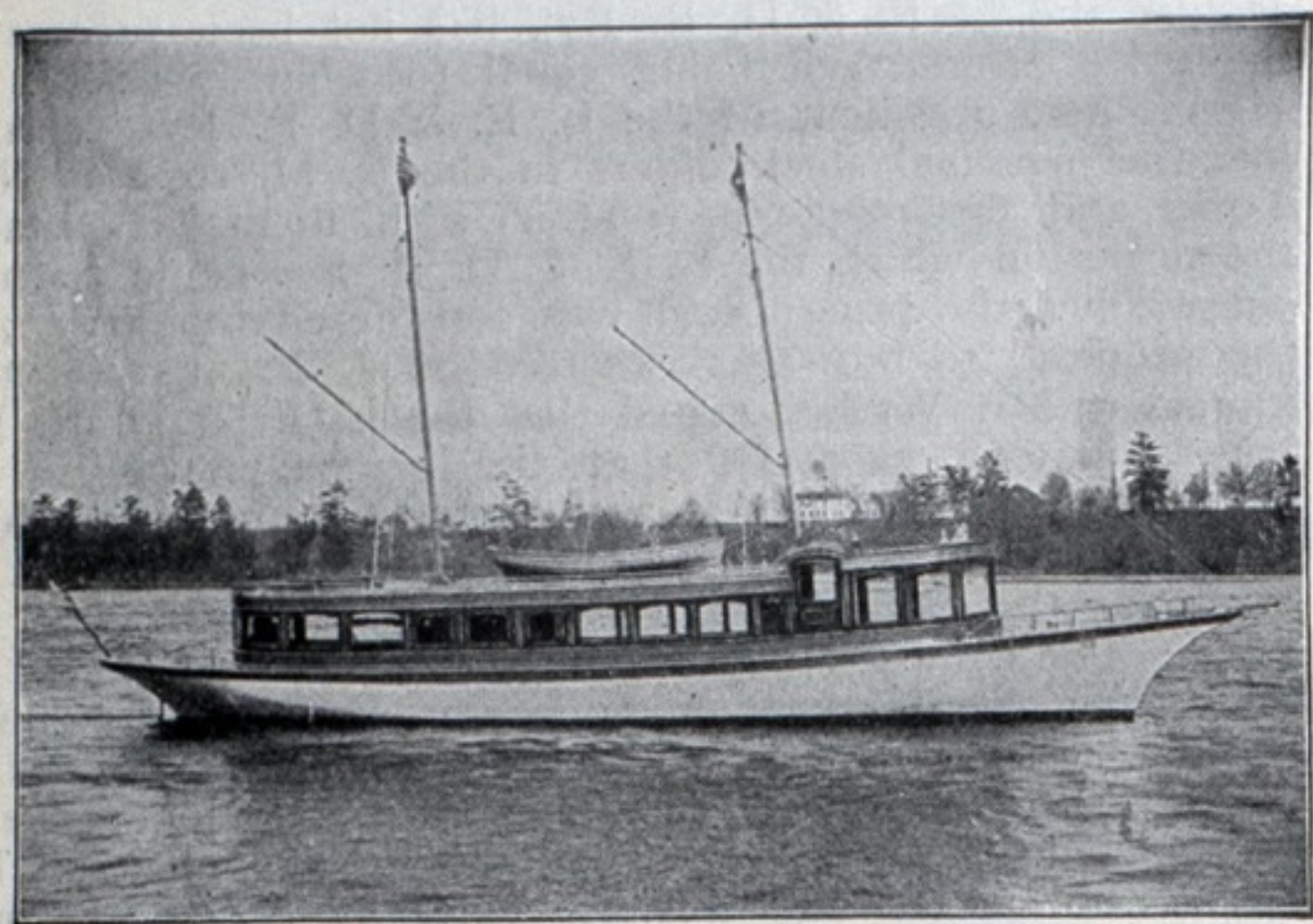
M. GOUBET the famous inventor of one type of the submarine vessels used in the French Navy, is now designing the largest submarine craft yet attempted. He intends to sail from Brest to New York guaranteeing to keep under water half way.

SOME interesting experiments in coaling at sea have just been carried out in mid-ocean by the British navy. The result was thoroughly successful, and it has been found that battleships can be safely coaled while traveling at the rate of ten knots. The Trafalgar and the Empress of India were the vessels experimented on.

AS TO THE general influence of trade papers in bringing about the present condition of American trade and commerce, which so frightens our European rivals, it is enough to say, remarks an exchange, that the remarkable advance of American industry and commerce, which has been the feature of our national existence during the past twenty-five years, began when the trade and technical press began its equally remarkable career, and if we may judge by the past there is an equally good field for usefulness for the trade paper of the future.

One of the most complete catalogues of nautical instruments ever issued, is the 1902 edition of the well known house, Messrs. John Bliss & Co., 128 Front street, New York City. It is replete with illustrations, descriptions and all necessary information regarding compasses, binacles, sounding machines, chronometers, log books, thermometers, barometers, sextants, taffrail logs, clocks, in fact every necessary kind of instrument pertaining to navigation. This house has the reputation of carrying the largest stock and most comprehensive assortment of works upon nautical subjects, etc., to be found in the country.

One of the most artistic creations in the catalogue line that we have seen lately is that of the Gas Engine & Power Co., and Chas. L. Seabury & Co., consolidated, manufacturers of steam yachts, launches, water tube boilers, etc., with works, yard and main office at Morris Heights, New York City. It really consists of three catalogues in one. Each section being devoted to the description and illustration of different branches of their work and product. The illustrations are particularly fine showing the work of an artist of ability, which coupled with the unique style in which the book is arranged, makes it one which should be in the hands of every interested person.



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A NEW SCHOOL FOR SEAMEN.

A BRIEF DESCRIPTION OF THE WELL KNOWN INSTITUTION
THAT IS TAKING UP THE TRAINING OF SEAFARING
PEOPLE BY MAIL.

We are informed that the well known International Correspondence Schools, of Scranton, Pa., are now offering courses of study for seamen. As this information is of vital importance to every member of the merchant marine or navy that realizes the benefit of technical training, we present herewith a brief statement of the origin and growth of the institution. The International Correspondence Schools developed from a Correspondence School of Mines, founded in 1891, by Mr. T. J. Foster, now president of the institution. As is well known, miners are required to pass examinations, for licenses before they are allowed to act as mine foremen or superintendents, and the idea occurred to Mr. Foster that miners could be provided with the information necessary to pass these examinations, entirely by mail, if the instructions sent them were systematic and simple, and the correction of their work received careful attention. As after events proved, the plan was a practical one, but neither Mr. Foster nor any of his associates had any conception of the wonderful system of training by mail that would be evolved from this little idea. The success of the Correspondence School of Mines was immediate. Over a thousand men accepted this opportunity for self-advancement within the first year of its existence. A demand soon sprung up for other courses, as they were prepared. This demand has continued to grow and is growing. New courses have been added every year, and scarcely a month goes by but the International Correspondence Schools announces that its system has been applied to the technics of some new trade or profession. Over 400,000 men, and women too, have enrolled in the schools during the last ten years, and it is stated that this number is increasing at the rate of 10,000 enrollments per month. These figures may appear exaggerated but when we consider that the institution has enrollment offices in every city of any size in the United States and Canada; that it has a force of representatives numbering over 1,500, and that it is one of the largest advertisers in the world, the probability of the correctness of these figures becomes apparent. Then again, the institution takes particular pains to see that every student is well satisfied with his connection with the schools, and the results of his training, with the result that each new student becomes a powerful lever for further business. With such a force behind it, it is small wonder that the enrollment is increasing at the present rate. Some idea of the extent of the work carried on may be gained from the statement that the main building shown in this article is only one of some eighteen or twenty that the Schools occupy in the city of Scranton, where they have over 1,000 employees, over 400 of whom are engaged entirely in instructing the students and correcting their work, and in writing and revising the text books that have made this institution so popular.

The position of the International Correspondence Schools in the educational field is unique. It provides special courses of training by mail for special positions or classes of work. For instance, if a man is working as an assistant engineer, mate, fireman, or other maritime occupation, and desires to qualify himself for advancement in his line of work, it is not necessary for him to stop work and go to a technical school to study. He can keep right on with his work and take a course of training by mail from the International Correspondence Schools. This illustration points out two strong reasons for this Schools' success: first, that the training by mail is conducted entirely in spare time and does not interfere with the student's regular occupation, and, second, that the student is taught only such facts, processes, and principles as are necessary for his success in some particular occupation or position. For instance, the Schools offer a complete course in Ocean Navigation, but the coast sailor or

lake pilot that wishes to increase his license need not take the complete Course. On the contrary, the Schools have a shorter and cheaper Course on Lake and Coast Navigation that will give him all the information necessary for him to increase his license, but no more and no less. The Schools also have a special Course for marine engineers and firemen who wish to raise their licenses.

This system of specialization is carried out by the Schools in all of the one hundred or more Courses offered, and is an indication of the general trend of the times. The institution does not claim or attempt to give a student a classic education or render him cultured, but confines itself strictly to qualifying him technically for the position he desires. It even has a department in effective operation that assists students in securing the promotions or new positions for which they are preparing. Its chief aim is to qualify those already at work for advancement and better pay in their chosen trade or profession.

There are many correspondence schools, but none have developed or obtained the confidence of the public to the extent that this institution has. Its success has been founded on the success of its students, and their success has been due to the excellence of the text books and instruction sent them for their home study without a



MAIN BUILDING INTERNATIONAL CORRESPONDENCE
SCHOOLS, SCRANTON, PA

teacher, the careful and conscientious correction of their work, and the assistance given them in overcoming the difficulties that are always certain to arise in the path of the ambitious worker that has had few educational advantages.

We feel justified in devoting some space to the description of this great institution because we believe it is for the mutual interest of every one engaged in the marine service, whether in the deck department or the engineer's department; to further any plan that aims to increase the efficiency of ambitious men. To say that these Schools are filling a long felt want would be no exaggeration, as it is the lack of this very technical training they give that has always been the barrier to promotion. How many men are there down in the fore-castle to-day who would be on the quarterdeck if they could pass the examination? Nor are they to blame. They could not afford to leave their work and come on land to obtain instruction for the license examination, even if they had the ambition. But here is an institution that brings the instruction straight to their berths. If you are interested write the International Correspondence Schools, and they will readily forward a full description of their Courses in Ocean and Lake Navigation and Marine Engineering, giving a clear statement of their system.

THE NEW BERMUDA DOCK.

BY J. R. SHEPSTONE.

The new floating dock recently launched on the Tyne, England, from the works of Messrs. C. S. Swan & Hunter, for the use of the British fleet at Bermuda, claims the distinction of being the longest and heaviest dock so far constructed. It has a length over all of 545 feet, while the hull weight of the structure, by which is meant the quantity of steel plates, bars and shapes, rivets, bolts, etc., and all other material essentially necessary to a dock, but not including machinery, timber or any other fittings, is just over 6,500 tons. The great Algiers dock at New Orleans certainly runs it very close, having a length of 525 feet and a hull weight of 5,850 tons.

The dock is to replace the famous old structure at Bermuda which was towed across the Atlantic in 1869, and has now become obsolete, not through age, but through the insufficiency of its dimensions. The length of the old dock was 381 feet over all, but to obtain its maximum lifting power gates were fitted, which reduced its practical length to 330 feet. Its inside width was 84 feet between side walls, and its lifting power was 8,000 tons, which was sufficient for the ships of the "Bellerophon" class, to lift which it was specially designed, although it was capable of bringing the keel out of the water of vessels up to 10,200 tons, the then heaviest ships of the day, represented by the long fully-rigged line-of-battle ships "Agincourt" and "Minotaur." The present dock is 545 feet long, and having no gates, the length of ship it can take is not restricted; its clear width of entrance between rubbing fenders is 100 feet. Its lifting power up to the pontoon deck level is 15,500 tons, but by utilizing the shallow pound this can be increased to 17,500 tons, and the walls are of sufficient height to allow of a vessel drawing 32 feet to be taken on 3 feet 6 inches keel blocks.

The present dock is of the type known as the floating graving dock, the invention of Messrs. Clark & Stanfield, of Victoria street, Westminster, London, from whose plans it was built, and who also designed the famous Algiers dock and many other similar structures. It was this firm who designed the Havana dock, which was built and launched by the same firm, Swan & Hunter, in the record time of seven and a half months.

The new dock is primarily intended to lift battleships of the largest class, displacing about 15,000 tons on a 27 feet 6 inches draught, and of a length of 390 feet, but with a bearing length of keel of only 343 feet. It has, however, also to deal with long cruisers of the "Terrible" class, of a displacement of 14,200 tons on a 27 foot draught a length of 500 feet between perpendiculars and a bearing keel of 383 feet; and lastly, it may be called upon to lift the auxiliary steamships of the subsidized mail lines, of which the "Campania" may be taken as a type. This ship in full fighting trim may displace as much as 19,000 tons on a 31 foot draught, but in ordinary docking condition, without full coal supply aboard, her weight will be about 16,500 to 17,000 tons. The length of this type of vessel is 600 feet between perpendiculars, while the bearing length of keel is 502 feet 8 inches.—Scientific American.

As the report goes the ship subsidy bill is in grave danger. So much opposition has developed in the House to it, especially among western Republicans, that it now seems out of the question to get the bill up for consideration this session.

The attitude of the six Senators from Iowa, Wisconsin and Vermont, recording their votes against the bill in the Senate has given its opponents in the House great courage. The representatives from these three states, while not declaring themselves as to the merits of the bill, are nearly all opposed to its consideration during the present session. There is a very delicate feeling among Republicans of the House in regard to the coming congressional elections, and a strong effort will be made to postpone any further action on ship subsidies on account of its effect on the campaign.

A LAKE THAT HAS NO OUTLET.

An American traveler fetches back with him from a visit in Australia the story of a most startling lake. Lake George, the largest lake of New South Wales, Australia, has no outlet except evaporation. For a series of years the brooks that tumble down the mountains which edge the lake may steadily contribute to it a larger quantity of water than is evaporated from its surface. Then the lake steadily rises. The water pushes north and south until the lake is twenty-one miles or more in length, with a width of seven or eight miles. For another series of years the water brought by the brooks may be steadily smaller than the quantity evaporated. Then the lake begins to fall, shrinking in a few years to half its former dimensions, this process going on sometimes till Lake George entirely disappears except for a few water holes in the lowest parts of its bed. The lake was in flood in 1891, extending north and south for twenty-one miles with a depth of twelve feet. Twice in the last century thousands of sheep and cattle were pastured on large areas now covered with water. They were the most numerous representatives there of the larger forms of animal life just as fish and water fowl are to-day. The cabins of the stock raisers or squatters, as they are called, were scattered over the meadows. Vegetables were raised and patches of wheat. So little was known of Lake George in those days that the herders really had a feeling of security and permanency, but the day came when the rising water swished around the cabins, drowned some of the stock, and drove the squatters to the highlands. Everybody knows now that the bed of Lake George offers a very uncertain tenure to settlers. When it comes into view again perhaps no attempt will be made to utilize it on so large a scale as was done in the 30's and 40's of the last century. The lake lies at the lower end of a basin so walled in by mountains and hills that the drainage into it has no chance to escape to the sea. It was long before this fact was discovered. Some early maps show Lake George as the probable source of a small river known on the coast, but a careful survey finally revealed the fact that not a drop of water escapes from the basin except to the clouds. The native blacks have always regarded it with superstitious dread. When they piloted the first exploring party to the lake in 1820 (the first reports of its existence came from the blacks in 1818) a splendid sheet of water was found. The whites were first perplexed and then amused by the stories the natives told them. It was years before it was discovered that the natives had been trying to tell, in their imperfect way, of phenomena that mystified them. It all seemed very uncanny to the poor blacks, who feared the lake and usually avoided it. Since 1849 the lake has never been wholly dry. It varies much in size, sometimes being only eight to ten miles long and four to six feet deep and then swelling again to its largest proportions. At times one may drive on dry land across a part of the lake where a few years later there are ten or twelve feet of water. In compliance with the general order issued to all Lake Huron life-saving stations to go into commissions on April 7th, the members of the crews of both the Middle Island and Thunder Bay Island stations have been notified to report for duty on that day. Capt. Persons, of the Thunder Bay Island station names his crew as follows: Lloyd Robbins, Cecil Matheson, Fred Ponier, Arthur Cleary, Ed. Richardson, Jas. Smith, Fred Oliver, and Fred Couture. Capt. Motley, of Middle Island, will be surrounded by the following crew: C. D. Coburn, W. L. Whitman, John Robinson, Joe Hubbard, David Tice, Jacob Hauch, Geo. Hassett and Joseph Kunna. Both crews are practically the same as last season, although one or two changes may develop before the time for going into commission. Both crews will leave Alpena on the evening of the 6th, in order to be on the island at midnight when the season will be considered open.

IRON MINES IN SIBERIA.

The industrial development of Siberia is largely dependent upon her production of coal and iron, especially the latter, and the following data from an official report show that Russia's huge northern provinces do not lack rich deposits of this metal. Of the numerous iron ore mines in the Urals, the largest are, first, the Komaroff mine, containing 1,600,000,000 tons of 50 per cent. brown hematite; and, second, the Magnithaya Gora mine, which has not yet been fully developed, but is claimed to be the largest mass of magnetite in Russia, if not in the world. Among other rich mines in the southern Urals are the Baikal mines, which are believed to contain 5,000,000 tons of ore in the portions belonging to the government, and 16,000,000 tons in that owned by the Simsky works; and the Elnitchi mines, near Baikal, in which about 1,000,000 tons of ore have been discovered. It is claimed that the latter group of mines, lying to the south of the Tcheliabinsk-Ufa branch of the Siberian railway, will yield 2,400,000,000 tons of iron ore. The Vyoskaya Gora, Mount Blagodat, and Sindrsky mines are to the north of the same railway. Engineers report that the first contains 16,000,000 tons; the ore in the second was estimated at 6,400,000 tons when first examined, but upon re-examination was found to amount to 13,000,000 tons. No definite estimate was made concerning the last mine, as it abounds in pockets which sometimes come to an abrupt termination. It is claimed that the Ural mines are capable of producing 24,000,000 tons of ore, or about 10,000,000 tons of pig iron, per annum for the next century; but as this quantity of ore can scarcely be worked, even with the additional coal from the Ekibaz-Tuza and Sudjenka mines, the more conservative engineers reckon the output at 5,000,000 tons a year, at which rate the ore in sight will last two hundred years. W. R. HOLLOWAY, St. Petersburg. Consul General.

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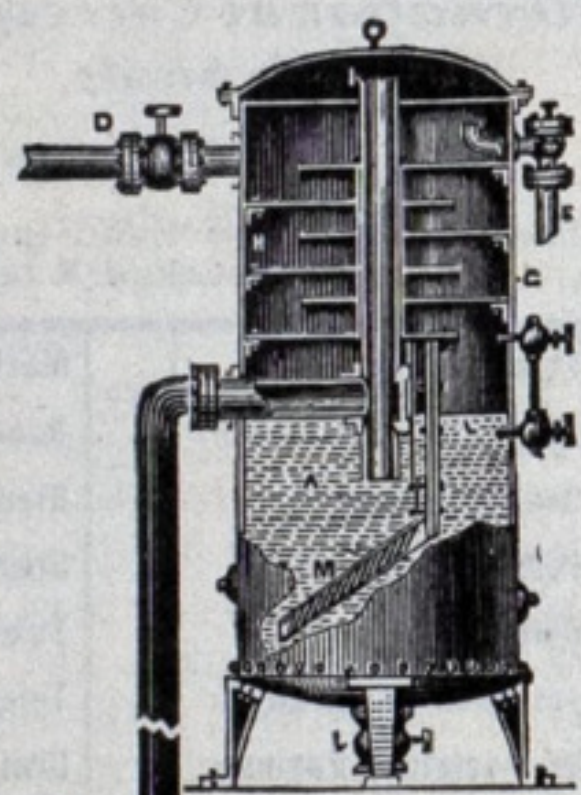
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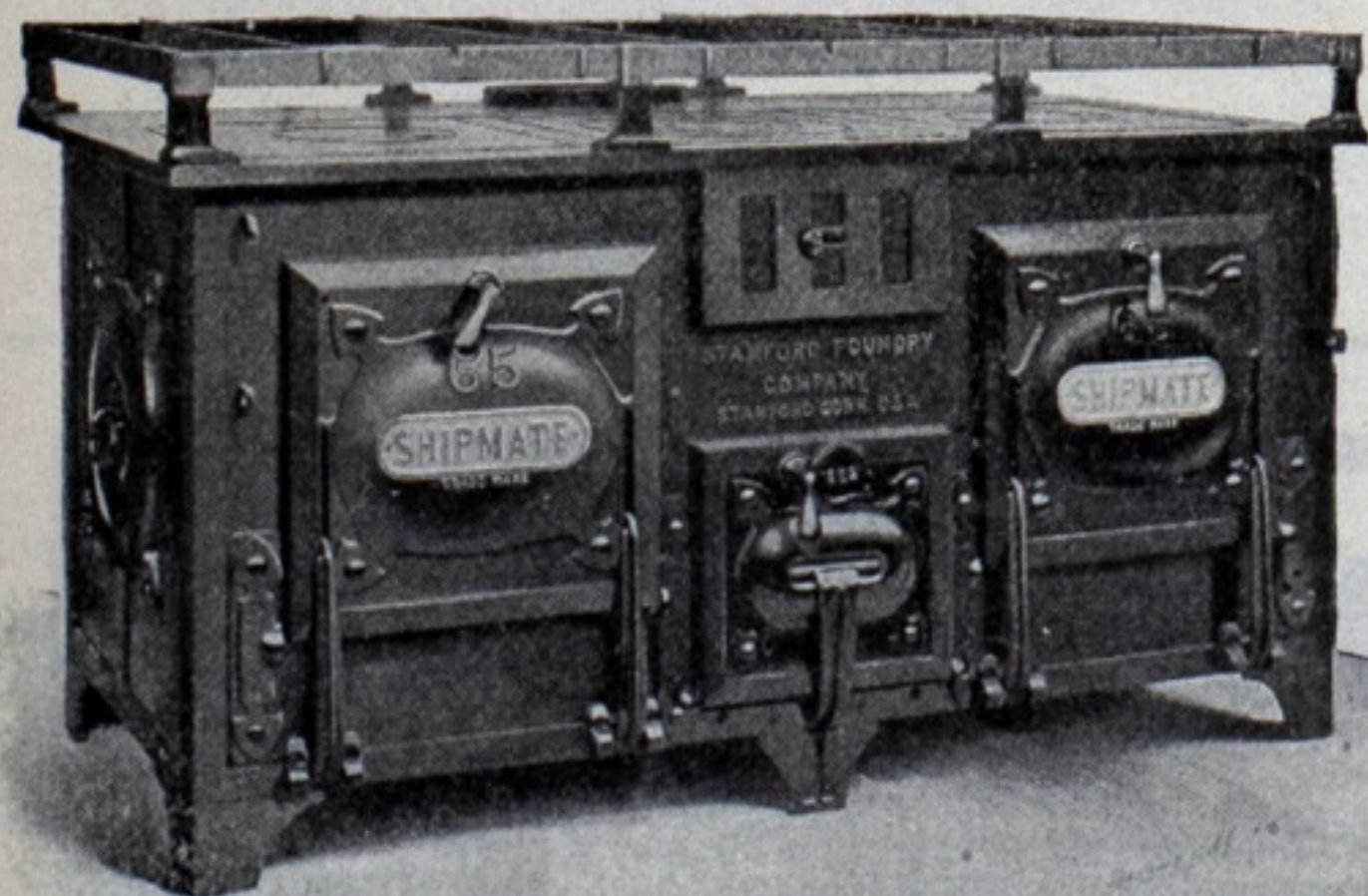
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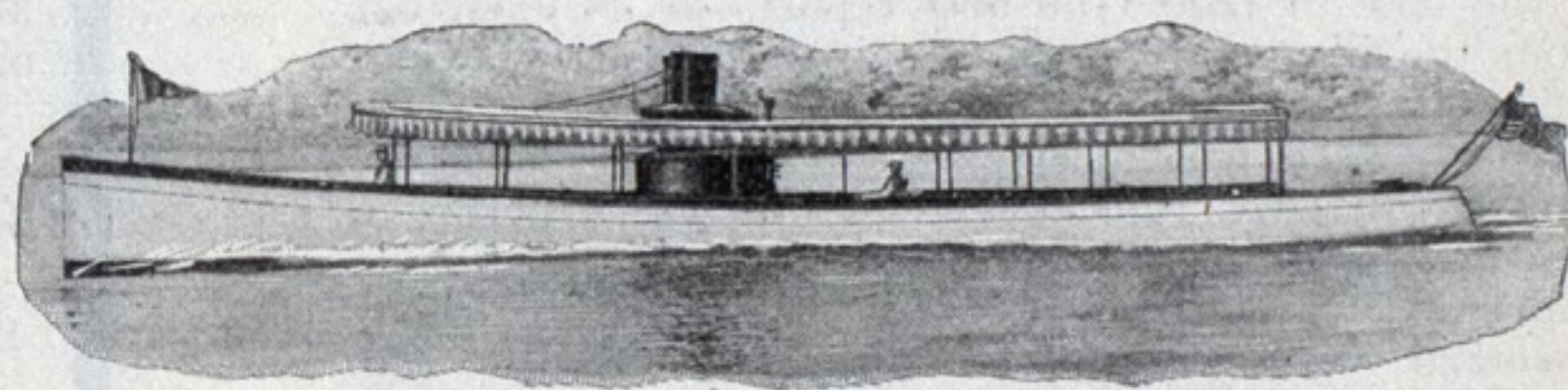
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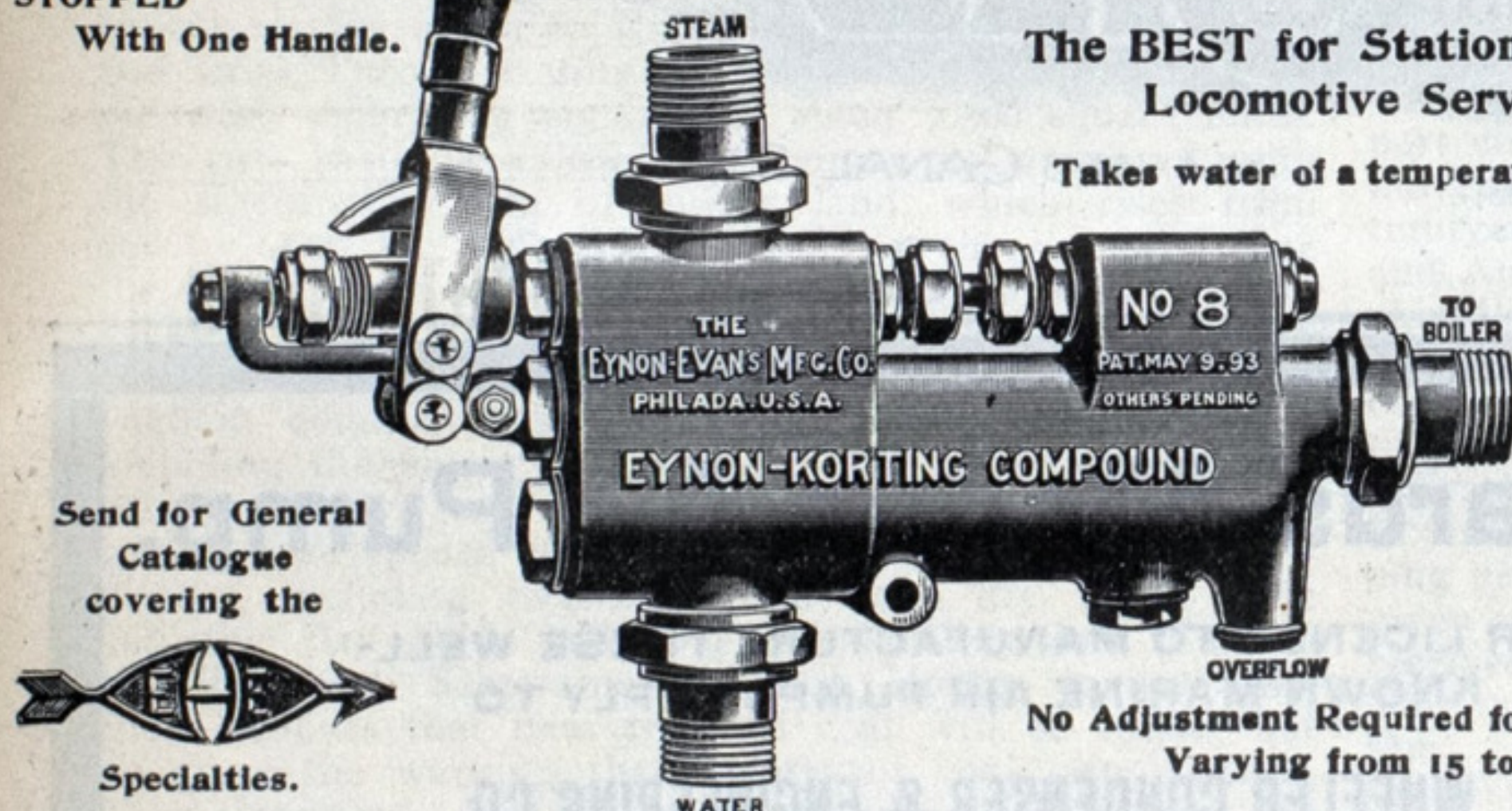
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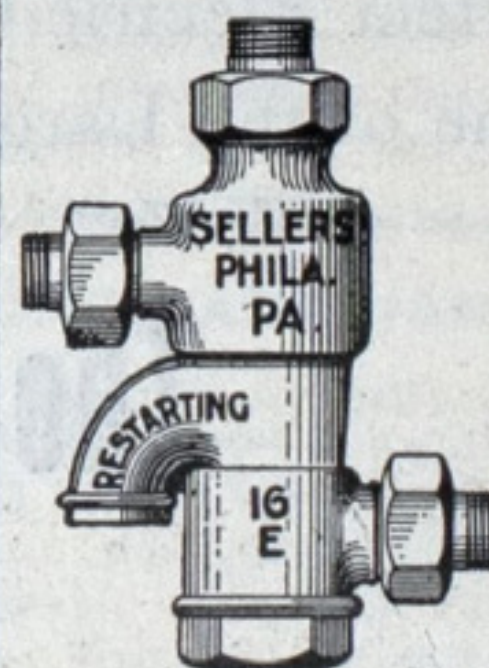
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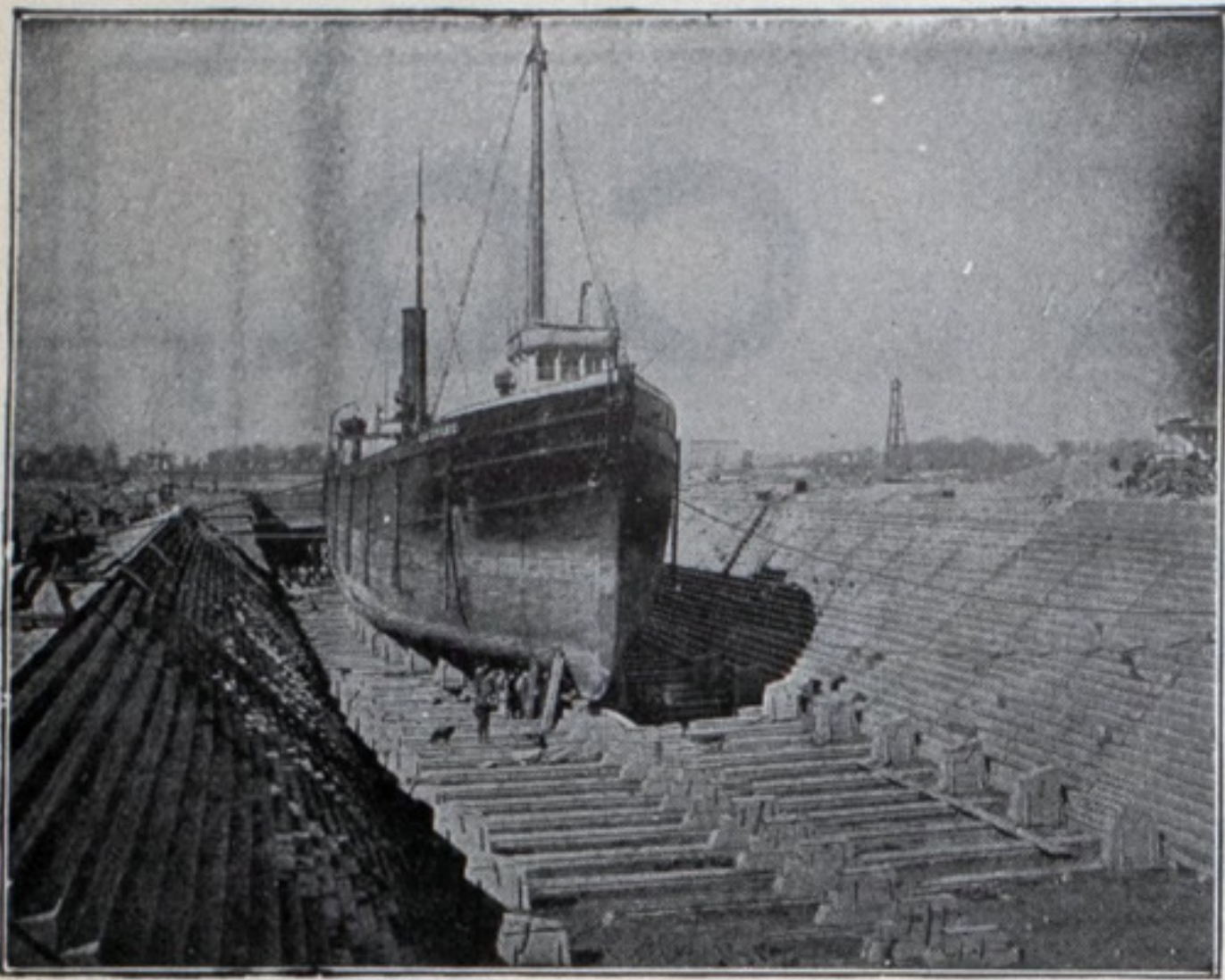


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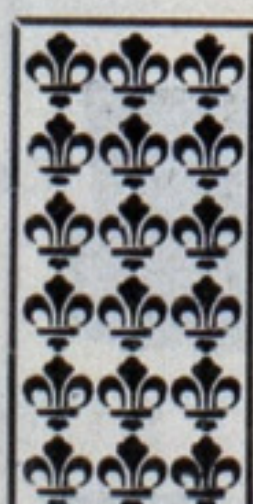
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